



**EMC[®] NetWorker[®]
Module for Sybase**

Release 3.0
UNIX Version

Administration Guide

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Preface..... vii

Chapter 1 Introduction

- NetWorker software 2
 - Software features 2
 - Server-side services and programs 2
- NetWorker Module for Sybase features 3
- New features in NMS software, Release 3.0 3
- How NMS interacts with Sybase database 3
 - NMS backup..... 4
 - NMS restore..... 6
- Internationalization support 7
- Password-protected database backup and restore 8
- Database backup and restore verification 9
- Exclusion of multiple user-defined temporary databases from backup 9

Chapter 2 Configuring NMS

- Configuration requirements..... 12
- Configuring the software in a noncluster environment..... 12
 - Task 1: Run the nms_config script 12
 - Task 2: Set Sybase roles and permissions..... 13
 - Task 3: Configure the NetWorker server resource 13
 - Task 4: Configure NetWorker user groups..... 14
 - Task 5: Configure the NetWorker Client resource 14
 - Task 6: Configure the NetWorker Device resource 15
 - Task 7: Configure NetWorker volume pools..... 16
 - Task 8: Set the NMS environment variables..... 16
 - Task 9: Set XBSA environment variables 17
 - Task 10: Select the operating system user account 17
- Configuring the software in a cluster environment..... 18
- References for additional configuration 19
- Dynamic loading of OCS library 19

Chapter 3 Performing Manual Backups

- About manual backups..... 22
 - How to configure a manual backup operation 22
 - Performing a consistency check 23

	Performing manual backups in a noncluster environment	24
	Performing full backups in a noncluster environment	24
	Performing incremental backups in a noncluster environment.....	25
	Customizing a backup.....	26
	Performing manual backups in a cluster environment	30
	Performing full backups in a cluster environment	30
	How to perform a full backup of one database	30
	How to perform a full backup of the Sybase server	31
	Performing incremental backups in a cluster environment	31
	How to perform an incremental backup of one database.....	31
	How to perform an incremental backup of the Sybase server	32
	Multistripe backups	32
	How to configure a multistripe backup.....	33
	Perform a multistripe backup	33
	Threshold procedures	34
	Sample threshold procedure	34
	Monitoring manual backups	35
	View the results of a backup	35
	Stopping manual backups	36
	Removing failed backups.....	36
Chapter 4	Performing Scheduled Backups	
	About scheduled backups.....	40
	Configuring scheduled backups in a noncluster environment	40
	Task 1: Customize the nsrsyb script for scheduled backups	40
	Task 2: Configure a NetWorker backup schedule	44
	Task 3: Configure a NMS group	44
	Task 4: Configure NetWorker volume pools.....	45
	Task 5: Configure the client resource for a scheduled Sybase backup.....	45
	Configuring scheduled backups in a cluster environment.....	46
	Testing scheduled backups	47
	Monitoring scheduled backups.....	48
	How to view the results of a backup.....	48
	Stopping scheduled backups.....	50
	Removing failed backups.....	50
Chapter 5	Restoring Data	
	About restoring data.....	52
	How to configure a restore operation.....	52
	Restoring data	53
	How to restore single or multiple databases	53
	How to perform a point-in-time restore	54
	How to perform a redirected restore	55
	How to perform an imported restore.....	56
	How to combine a relocated and imported restore	57
	How to restore the Sybase server in a cluster environment	57
	How to perform a multistripe restore.....	58
Chapter 6	Disaster Recovery	
	About disaster recovery	60
	Recover the Sybase server after a disk crash.....	60
	Recover the NetWorker server and Sybase server after a disk crash	60
	Recover the master database	61

	Recover user databases	62
Appendix A	NMS Commands	
	Syntax for NMS commands	66
	Conventions.....	66
	Sybase usernames and passwords.....	66
	NMS commands.....	68
	nsrsybcc.....	68
	nsrsybrc.....	69
	nsrsybsv	69
Appendix B	XBSA Variables	
	About XBSA environment variables	72
	XBSA environment variables definitions and values.....	72
	NSR_BACKUP_LEVEL	73
	NSR_CLIENT	73
	NSR_COMPRESSION.....	73
	NSR_DATA_VOLUME_POOL	73
	NSR_DEBUG_FILE	73
	NSR_DEBUG_LEVEL	74
	NSR_GROUP.....	74
	NSR_LOG_VOLUME_POOL	74
	NSR_NO_BUSY_ERRORS	74
	NSR_SAVESET_NAME.....	74
	NSR_SERVER	75
	NSR_AES_ENCRYPTION	75
	NSR_ENCRYPTION_PHRASES	75
Appendix C	The isql Commands	
	Syntax for isql commands	78
	Loading and dumping a database.....	78
	How to dump a database	78
	How to load a database	78
	Loading and dumping a transaction log.....	79
	How to dump a transaction log.....	79
	How to load a transaction log.....	79
	How to find the timestamp for a save set	79
	Recovering a database and transaction logs.....	80
Appendix D	Troubleshooting and Error Messages	
	Displaying release information.....	84
	Verifying version information.....	84
	Diagnostic and error messages	84
	How to send error and diagnostic messages to different files.....	84
	How to control the level of detail reported in messages	84
	NMS error messages.....	85
	nsrsyb command.....	85
	nsrsybcc command	85
	nsrsybrc command	86
	Sybase Backup Server and libbms error messages	92
	NetWorker XBSA and libbms error messages	94

As part of its effort to continuously improve and enhance the performance and capabilities of its software products, EMC periodically releases new versions of its hardware and software. Therefore, some functions described in this document may not be supported by all revisions of the software or hardware currently in use. The release notes for this product provides the most up-to-date information on product features.

Audience This guide is part of the NetWorker Module for Sybase documentation set, and is intended for use by system administrators during configuration of the NetWorker Module for Sybase software.

Readers of this guide are expected to be familiar with the following topics:

- ◆ EMC NetWorker software
- ◆ Sybase software

Organization Here is a list of where information is located in this document.

[Chapter 1, "Introduction,"](#) describes the main features of the product.

[Chapter 2, "Configuring NMS,"](#) describes the procedures for configuring NetWorker Module for Sybase backups and restores.

[Chapter 3, "Performing Manual Backups,"](#) describes the procedures for running manual NetWorker Module for Sybase backups.

[Chapter 4, "Performing Scheduled Backups,"](#) describes the procedures for configuring and running scheduled NetWorker Module for Sybase backups.

[Chapter 5, "Restoring Data,"](#) describes the procedures for restoring and recovering from NetWorker Module for Sybase backups.

[Chapter 6, "Disaster Recovery,"](#) describes the procedures necessary to recover data quickly in a disaster recovery situation.

[Appendix A, "NMS Commands,"](#) describes the NetWorker Module for Sybase commands.

[Appendix B, "XBSA Variables,"](#) describes the environment variables that can be set for NetWorker Module for Sybase backups and restores.

[Appendix C, "The isql Commands,"](#) describes isql commands.

[Appendix D, "Troubleshooting and Error Messages,"](#) describes troubleshooting and error messages.

Related documentation

Related documents include:

- ◆ Sybase backup and recovery documentation
- ◆ *EMC NetWorker Module for Sybase, Release 3.0, UNIX Version, Installation Guide*
- ◆ *EMC NetWorker Module for Sybase, Release 3.0, UNIX Version, Release Notes*
- ◆ *EMC NetWorker Administration Guide* for the appropriate operating system
- ◆ *EMC NetWorker Release Notes* for the appropriate operating system
- ◆ UNIX man pages
- ◆ *EMC Command Reference Guide*
- ◆ *EMC Information Protection Software Compatibility Guide*
- ◆ *NetWorker Disaster Recovery Guide*

Conventions used in this document

EMC uses the following conventions for notes and cautions.

Note: A note presents information that is important, but not hazard-related.



CAUTION

A caution contains information essential to avoid data loss or damage to the system configuration.



IMPORTANT

An important notice contains information essential to operation of the software.

Typographical conventions

EMC uses the following type style conventions in this document:

Normal font

In running text:

- Interface elements (for example, button names, dialog box names) outside of procedures
- Items that user selects outside of procedures
- Java classes and interface names
- Names of resources, attributes, pools, Boolean expressions, buttons, DQL statements, keywords, clauses, environment variables, filenames, functions, menu names, utilities
- Pathnames, URLs, filenames, directory names, computer names, links, groups, service keys, file systems, environment variables (for example, command line and text), notifications

Bold

In procedures:

- Names of dialog boxes, buttons, icons, menus, fields
- Selections from the user interface, including menu items and field entries
- Key names
- Window names

In running text:

- Command names, daemons, options, programs, processes, notifications, system calls, man pages, services, applications, utilities, kernels.

Italic

Used for:

- Full publications titles referenced in text
- Unique word usage in text

Bold Italic

Anything requiring extra emphasis

<code>Courier</code>	Used for: <ul style="list-style-type: none"> • System output • Filenames • Complete paths • command-line entries • URLs
<code>Courier, bold</code>	Used for: <ul style="list-style-type: none"> • User entry • Options in command-line syntax
<code><i>Courier, italic</i></code>	Used for: <ul style="list-style-type: none"> • Arguments used in examples of command-line syntax • Variables in examples of screen or file output • Variables in path names
<code><i>Courier, bold, italic</i></code>	Variables used in a command-line sample
<code>< ></code>	Angle brackets enclose parameter or variable values supplied by the user
<code>[]</code>	Square brackets indicate optional values
<code> </code>	Vertical bar indicates alternate selections. The bar means "or"
<code>{ }</code>	Braces indicate content that you must specify (that is, x or y or z)
<code>...</code>	Ellipses indicate nonessential information omitted from the example

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Product information — For documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to the EMC Powerlink™ website (registration required) at:

<http://Powerlink.EMC.com>

Technical support — For technical support, go to EMC Customer Service on Powerlink. To open a service request through Powerlink, you must have a valid support agreement. Please contact your EMC sales representative for details about obtaining a valid support agreement or to answer any questions about your account.

Your comments Comments and suggestions about our product documentation are always welcome.

To provide feedback:

1. Go to:

<http://Powerlink.EMC.com>

2. Click the Feedback link.

This chapter describes the NetWorker Module for Sybase software, and how the NetWorker Module for Sybase and NetWorker software components work together to provide a comprehensive Sybase data storage management system.

This chapter includes the following sections:

- ◆ NetWorker software..... 2
- ◆ NetWorker Module for Sybase features..... 3
- ◆ New features in NMS software, Release 3.0..... 3
- ◆ How NMS interacts with Sybase database..... 3
- ◆ Internationalization support..... 7
- ◆ Password-protected database backup and restore..... 8
- ◆ Database backup and restore verification 9
- ◆ Exclusion of multiple user-defined temporary databases from backup..... 9

Note: This guide refers to Sybase Adaptive Server Enterprise (ASE) as Sybase server.

NetWorker software

The NetWorker[®] product is a network data storage management solution that protects and helps manage data across an entire network. The NetWorker software simplifies the storage management process and reduces the administrative burden by automating and centralizing data storage.

Software features

The NetWorker software provides the capabilities to do the following:

- ◆ Perform automated backups
- ◆ Administer, configure, monitor, and control NetWorker functions from any system on a network
- ◆ Centralize and automate data management tasks
- ◆ Optimize performance by using parallel save streams to a single device, multiple devices, or storage nodes

The NetWorker software provides support for the following:

- ◆ Enterprise applications running on AIX, HP-UX, Solaris, Windows, and Linux
- ◆ Cluster environments including High Availability Cluster Multiprocessing for AIX and HP platforms.

NetWorker client/server technology uses the Remote Procedure Call (RPC) to back up data. The NetWorker server software consists of several server-side services and programs that oversee backup and restore processes. The NetWorker client software consists of client-side services and user interface programs.

Server-side services and programs

The server-side services and programs perform the following functions:

- ◆ Oversee backup and restore processes
- ◆ Maintain client configuration files
- ◆ Maintain an online client file index
- ◆ Maintain an online media database

During a backup, the NetWorker server makes an entry in an online client file index and records the location of the data in an online media database. These entries provide restore information needed for every database that is backed up. The client file index entry is maintained until the client's save set exceeds its configured browse policy.

When the client's save set retention policy exceeds its configured retention policy, the save set changes status from *recoverable* to *recyclable* in the media database. When all the save sets on the storage media change status to *recyclable*, the media mode changes status to *recyclable*, and the media is eligible for automatic relabeling. The save set entries, however, remain in the media database until the media is actually relabeled. Data is still recoverable, by using the NetWorker **scanner** command, until the media is relabeled.

After a scheduled backup, NetWorker software sends a record of the server's bootstrap file to the default printer. This printed record of the dates, locations, and save set ID numbers for the server's online indexes is required for restoring data.

Keep the bootstrap printout on file as a quick reference in the event of a disaster, such as a disk crash or server malfunction.

The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* provides details about the NetWorker product.

NetWorker Module for Sybase features

The NetWorker Module for Sybase (NMS) software enhances the NetWorker software and provides the following services:

- ◆ Integration of database and file system backups
- ◆ Restore of Sybase databases
- ◆ Backup to a centralized backup server
- ◆ Integrated backup and restore for Sybase databases
- ◆ Automated management of backup media
- ◆ Manual and scheduled Sybase database backups
- ◆ Storage management through automated scheduling, autochanger support, electronic tape labeling, and tracking
- ◆ Secure restore of data to alternate database instances (on original computer or different one)
- ◆ Database exclusion and selection
- ◆ Multistripe backup and recovery
- ◆ Multiple backup sessions
- ◆ Full browse and retention policies
- ◆ Full and incremental backups
- ◆ Multiple, concurrent high-speed devices, such as DLT drives

New features in NMS software, Release 3.0

NMS software, Release 3.0 provides the following new features:

- ◆ [“Internationalization support” on page 7](#)
- ◆ [“Password-protected database backup and restore” on page 8](#)
- ◆ [“Database backup and restore verification” on page 9](#)
- ◆ [“Exclusion of multiple user-defined temporary databases from backup” on page 9](#)
- ◆ [“Dynamic loading of OCS library” on page 19](#)
- ◆ [“Improved reporting of scheduled backups” on page 48](#)

How NMS interacts with Sybase database

The NetWorker software and the NMS software provide storage management services for Sybase databases through an X-Open Backup Services Application Programming Interface (XBSA API) connection to the Sybase Backup Server Archive API.

NetWorker and NMS interact with the Sybase database as follows:

1. When **nsrd** triggers a scheduled backup for a Sybase server instance on the NetWorker server, **savegrp** communicates with **nsrexecd** daemon on the client machine.
2. The **nsrexecd** daemon runs the **nsrsyb** script.
3. The **nsrsyb** script runs **nsrsybsv**, which communicates with the Sybase ASE server through Sybase Open Client/Server interface. The Sybase ASE server delegates the task of backup and recovery to the Sybase Backup Server.
4. The NetWorker **libbms** shared library:
 - a. Accepts API calls from the Sybase Backup Server.
 - b. Translates the API calls into XBSA calls.
 - c. Sends the XBSA calls to the NetWorker software.

NMS backup

Install the NMS software on the system where the Sybase server is installed. The Sybase server can exist either on the same system as the NetWorker server software, or on a separate system. No matter where the system that is running the Sybase server software resides, the system is considered a storage management client of the NetWorker server.

During a backup, the following occur:

1. The NetWorker software takes care of the scheduling and storage management tasks.
2. The NetWorker **libbms** shared library takes care of passing the data from the Sybase Backup Server to the NetWorker software.
3. During a backup, the NMS script **nsrsyb** is substituted for the NetWorker client program **save**.

Figure 1 shows the functional relationship between the NetWorker software, the NMS software, and Sybase database during a scheduled backup.

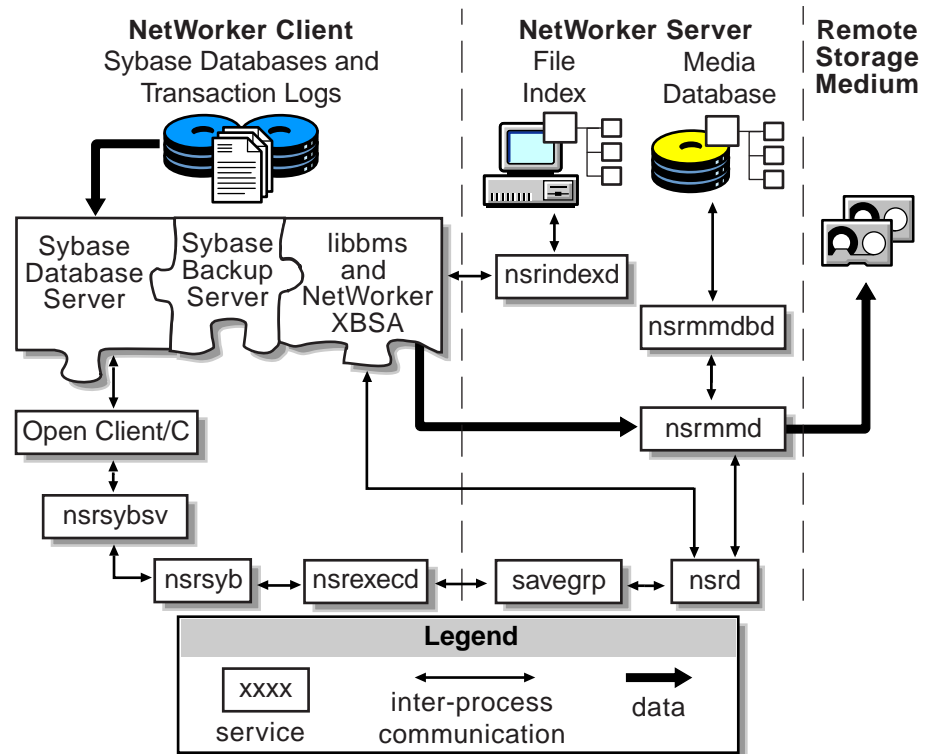


Figure 1 Data movement through the Sybase server during backups

About backup levels

The NMS software translates valid NetWorker levels to Sybase **dump** commands. Table 1 lists the NetWorker levels and their Sybase dump command translations.

Table 1 NMS backup level translations

NetWorker	Sybase server	NMS software response
Full	Dump database	Full backup of a database and its transaction logs.
Incremental	Dump transaction log	Backup of all changes to the database since the last dump.
1-9	Not valid	Failed backup with an error message.
Consolidate	Not valid	Failed backup with an error message.
Skip	Skip	Skips the scheduled backup.

Full NetWorker backup

A full NMS backup sends the **dump** database command to Sybase, which backs up the entire database, including both the data and transaction log. If incremental backups are *not* allowed for a database, the inactive portion of the transaction log is truncated.

Incremental NetWorker backup

An incremental NMS backup sends the **dump** transaction command to Sybase, which backs up the transaction log and truncates the inactive portion of the transaction log.

Incremental backups are *not* allowed under the following conditions:

- ◆ The database and transaction logs are on the same device.
- ◆ The select into/bulk copy option is selected and the database contains unlogged data.
- ◆ The truncate log on checkpoint option is selected.
- ◆ A full backup has *never* been performed.

When an incremental backup is *not* allowed, the backup is promoted to full. After the backup, the inactive portion of the database log is truncated.

NMS restore

When a recovery request is initiated, the following occurs:

1. The NetWorker **libbms** shared library:
 - Translates the object names requested by the **nsrsybrc** or the **load** command into a format understood by the NetWorker software, and forwards it to the NetWorker server's **nsrd** daemon.
 - Sends a request to the **nsrindexd** index daemon.
2. The **nsrindexd** daemon checks the client file index to ensure that an entry for the requested objects exists, and passes this information to **libbms**.
3. The **libbms** library requests the data from the **nsrmmmd** media daemon.
4. The **nsrmmmd** daemon searches the NetWorker server's media database for the media containing the objects requested and recovers the data to the Sybase server.

Figure 2 shows the relationship between NetWorker software, the NMS software and Sybase during a restore.

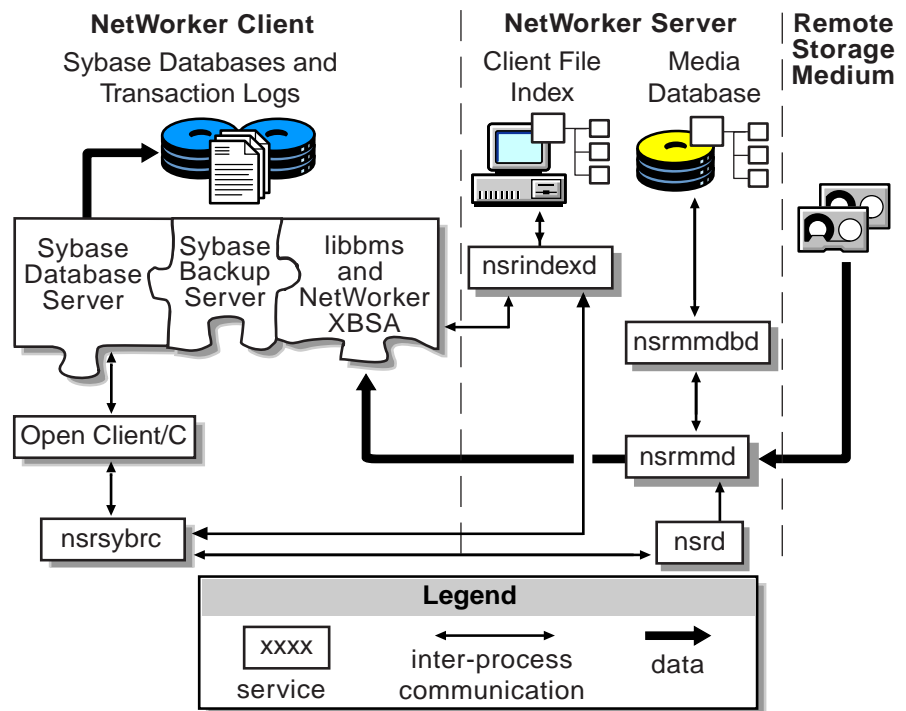


Figure 2 Data movement through the Sybase server during restore

Internationalization support

The internationalization support available in this release of NMS allows it to operate in non-ASCII environments.

NMS extends the internationalization support available in NetWorker, Release 7.4. NetWorker, Release 7.4 supports systems running in different locales (that is, in multilocale data zones) with no data loss within NetWorker when non-ASCII text data is transmitted between systems or processes due to locale differences.

For the NMS software to operate in non-ASCII environment, ensure that you have the following:

- ◆ NetWorker 7.4 client
- ◆ Supported operating system configured to operate in a non-ASCII locale
- ◆ Sybase server installation configured with a non-ASCII character sets

The internationalization support available in NMS, Release 3.0 provides the following features:

- ◆ You can create non-ASCII databases on a Sybase server and do backup and restore operations.
- ◆ For **nsrsybsv**, **nsrsybrc**, and **nsrsybcc** commands, you can specify non-ASCII characters for the following command line options:
 - **-U** *<UserName_non-ASCII>*
 - **-P** *<Password_non-ASCII>*
 - **-r** *<Password_non-ASCII>* (only for **nsrsybsv** and **nsrsybrc**)
 - **SYBASE: /<SERVERNAME_ASCII> /<DBName_non-ASCII>**

Thus, the username, password, and database names can be non-ASCII.

However, the keyword for save set, SYBASE, and the Sybase server name can not be non-ASCII.

- ◆ You can specify non-ASCII characters for the following environment variables that are specified in the **nsrsyb** script:
 - POSTCOMD
 - PRECMD
 - NSR_DEBUG_FILE
 - SYBASE
 - NSR_SAVESET_NAME
 - NSR_ASE_PASSWORD

- ◆ You can type the inputs to the NMS software in non-ASCII language.

- ◆ Prior to this release of NMS, the error messages that were provided to the Sybase Backup Server were in ASCII only. In NMS, Release 3.0, operational messages and debug messages are displayed in different ways. While operational messages are displayed in non-ASCII format, debug messages are displayed in ASCII format.

NMS, Release 3.0 provides error messages in the non-ASCII language if the appropriate language pack is installed on the system. For example, if the French language pack is installed on the system and NMS is running in the French environment, then the messages returned to the Sybase Backup Server by NMS are in French. However, if the system does not have the French language pack installed, then messages are returned to the Sybase Backup Server in English only.

NMS logs operational messages in a locale-independent format. A log viewer, the NetWorker utility **nsr_render_log**, reads and interprets the messages based on the user locale setting at the time of rendering the log messages. The viewer then translates the messages using lookups from the appropriate message catalog that resides in language-specific directories. If a localized version of a message is not found, the log viewer displays the message in English.

The operational messages are logged in the `daemon.raw` file, which is available in the NetWorker logs directory.

The debug messages for the **nsrsybsv**, **nsrsybrc**, and **nsrsybcc** processes have their own specific log files. They are `nsrsybsv.<PID>.dbg` for **nsrsybsv**, `nsrsybrc.<PID>.dbg` for **nsrsybrc**, and `nsrsybcc.<PID>.dbg` for **nsrsybcc**, where `<PID>` is the process ID. The messages in these files are in ASCII. The debug files are available in the `applogs` directory.

Password-protected database backup and restore

NMS software provides full support for password-protected database backup and recovery.

If the backed up data is password-protected at the time of backup, the same password must be provided to recover the backed up data. If the password does not match the one used at the time of backup, then the recovery fails and an appropriate error message is added to the log file.

The password must be between 6 and 30 characters long. Any password less than 6 characters or more than 30 characters is not accepted. The NMS software does not continue with the backup if an invalid password is provided.

Use one of the following methods to password-protect the backed up data:

- ◆ Use the clause "with passwd = PASSWORD" along with the backup command. This ensures that the backup server uses the password to protect the backup data.
- ◆ Use the environment variable `NSR_ASE_PASSWORD` to set the desired password. If the value is left blank then the data is not password-protected. The password specified in the parameter `NSR_ASE_PASSWORD` in the **nsrsyb** script is in unencrypted form.
- ◆ Specify the `-r` option with the desired password from the command line. This option is valid for the **nsrsybsv** backup and the **nsrsybrc** restore commands:

```
nsrsybsv -r HiPassword
```

```
nsrsybrc -r HiPassword
```

Database backup and restore verification

The NMS software provides support for database backup and restore verification with ASE 12.5.4 and above (excluding ASE 15.0).

Verification at the header or a full verification can be done. While a header verification only verifies the page header information, full verification verifies both the header and the rows structure.

Use one of the following methods to set the verification level:

- ◆ Use the clause "with verify = header | full" with the backup/restore command. This ensures that backup server carries out the verification at the header level or full verification based on whether "header" or "full" is used in the clause.
- ◆ Specify the verification level to be used by setting the environment variable `NSR_ASE_VERIFY` to the desired value. If the value is left blank, then verification is not carried out. All other values are ignored.
- ◆ Specify the verification level from the command line by setting the option `-V` to the desired value.

```
nsrsybsv -v [header | full]
```

```
nsrsybrc -v [header | full]
```

[header | full] This option is valid for `nsrsybsv` and `nsrsybrc` commands. The value for the verification level is not case sensitive and the valid values for the options are *header* or *full*. If the verification value is left blank, then no verification is carried out and a message is added to the log file.

```
nsrsybrc -v [verify-only]
```

[verify-only] The validation of the option provided by you is done by Sybase server.

Exclusion of multiple user-defined temporary databases from backup

The Sybase server, version 12.5.0.3 supports multiple user-defined temporary databases.

In addition to the system-defined temporary database *tempdb*, you can create user-defined temporary databases. These temporary databases are attached with a specific user login or a database. Creating temporary databases enhances the performance of a database where many transactions take place at a time. Also, creating temporary databases prevents the critical applications from failing when the system defined database fails.

In NMS, Release 2.5 and earlier, the temporary databases are backed up, but recovery fails when NMS comes across even a single database backup failure.

NMS, Release 3.0 excludes the user-defined temporary databases during backup, and continues to recover as many databases as possible even after database backup failures.

The databases backed up by NMS, Release 2.5 can be recovered by NMS, Release 3.0. For example, NMS, Release 2.5 backs up databases db1, db2, master, temp1, admin, and security, where temp1 is a user-defined temporary database. Because the recovery of the temp1 database fails, the admin and security databases are not recovered. By using NMS, Release 3.0, you can recover the databases backed up by

NMS, Release 2.5. NMS, Release 3.0 restores db1, db2, master, admin, and security databases, but does not temp1.

NMS, Release 3.0 checks and determines whether a database is a user-defined temporary database or a normal database. To perform this check NMS communicates with the Sybase server. If the NSR_DEBUG_FILE variable is set, then a debug message "User-defined temporary database %s excluded from backup" is printed in the debug file, where %s is the name of the user-defined temporary database.

This chapter describes how to configure the NMS software for each Sybase server that requires backup and recovery services.

This chapter includes the following sections:

- ◆ Configuration requirements 12
- ◆ Configuring the software in a noncluster environment 12
- ◆ Configuring the software in a cluster environment 18
- ◆ References for additional configuration 19
- ◆ Dynamic loading of OCS library 19

Configuration requirements

NMS software supports the concurrent backup of Sybase databases on separate computers to the same NetWorker server.

To perform concurrent backups, install the NMS software:

- ◆ On the same computer, where the Sybase server and NetWorker client software are installed.
- ◆ Only once per computer, regardless of the number of Sybase server instances and databases that are to be backed up.

The *NetWorker Module for Sybase, Release 3.0, UNIX Version, Installation Guide* provides the installation instructions.

You can back up all data locally or remotely to the same NetWorker server.

Configuring the software in a noncluster environment

To configure the NMS software, perform the following tasks in the following order:

- ◆ [“Task 1: Run the nms_config script” on page 12](#)
- ◆ [“Task 2: Set Sybase roles and permissions” on page 13](#)
- ◆ [“Task 3: Configure the NetWorker server resource” on page 13](#)
- ◆ [“Task 4: Configure NetWorker user groups” on page 14](#)
- ◆ [“Task 5: Configure the NetWorker Client resource” on page 14](#)
- ◆ [“Task 6: Configure the NetWorker Device resource” on page 15](#)
- ◆ [“Task 7: Configure NetWorker volume pools” on page 16](#)
- ◆ [“Task 8: Set the NMS environment variables” on page 16](#)
- ◆ [“Task 9: Set XBSA environment variables” on page 17](#)
- ◆ [“Task 10: Select the operating system user account” on page 17](#)

Task 1: Run the nms_config script

The **nms_config** script creates a symbolic link for the **libbms** shared library in the `$$SYBASE/$$SYBASE_ASE/lib` directory. Before running a backup and recovery, run the **nms_config** script.

To run the **nms_config** script:

1. On the system where the NMS software is installed, log in as root.
2. Run the **nms_config** script using the following commands:
 - For AIX:


```
cd /usr/bin
./nms_config
```
 - For HP-UX:


```
cd /opt/networker/bin
./nms_config
```
 - For Solaris:


```
cd /usr/sbin
```

```
./nms_config
• For Linux:
cd /usr/sbin
./nms_config
```

- At the prompt, specify the location of the Sybase ASE directory.

Task 2: Set Sybase roles and permissions

Because the NMS software relies on the administrator's ability to dump and load databases when performing backup and recovery operations, the administrator must have the appropriate Sybase roles and permissions.

[Table 2](#) lists the Sybase roles and permissions required for performing NMS administrative actions

Table 2 Sybase roles and permissions

Role/permission	Action	NMS command
SA_role or create database privileges	Create a database.	n/a
SA_role, DBO (database ownership), or OPER_role	Back up and restore databases.	nsrsybsv nsrsybrc
SA_role, DBO	Run a database consistency check.	nsrsybcc

During a scheduled NetWorker backup or a database consistency check, the **nsrsybcc** command runs by default. The Sybase OPER_role does *not* have permission to run a database consistency check. Therefore, an administrator with an OPER_role *cannot* run a scheduled NetWorker backup of the Sybase server without first disabling the consistency check.

If the Sybase OPER_role administrator backs up the database, the NMS software requires that the Sybase user be a member of the database in order to check whether the database and log are on separate segments. If the Sybase administrator is *not* a member of the database, then the backup fails. However, this limitation does *not* apply to recovering the Sybase database.

Task 3: Configure the NetWorker server resource

A NetWorker server resource must be configured with attribute settings that influence the performance and security of backups before configuring the NetWorker software.

To configure the NetWorker server resource:

- Ensure that the NetWorker server is configured to:
 - Identify the correct NetWorker server.
 - Specify an appropriate parallelism value.
 - Specify the required usernames in the NetWorker administrator list.

The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* provides information on how to configure a NetWorker server resource.

- In the server resource, verify that the attribute settings are valid for the Sybase backup environment. Modify settings as required.

Table 3 describes the main NetWorker server resource attributes.

Table 3 NetWorker server resource attributes

Attribute	Description
Name	Specifies the hostname of the NetWorker server.
Parallelism	Specifies the maximum number of backup save streams that the NetWorker software allows to arrive concurrently at the server. The NetWorker server edition determines the maximum parallelism value. When multiple data streams are backed up at the same time, the efficiency of the storage devices increases.
Administrator	Specifies users with NetWorker Administrator privileges. The default setting of the attribute is <code>root@hostname</code> NetWorker, where <code>hostname</code> is the NetWorker server hostname.

Task 4: Configure NetWorker user groups

For NetWorker, Release 7.4, use the NetWorker access control feature to assign users on the NetWorker client to NetWorker user groups. Each user group has a specific set of privileges associated with it. This is defined in the Privileges attribute of the User Group resource.

Note: Access control is a new feature introduced with NetWorker, Release 7.4 and is *not* supported in earlier versions of NetWorker software.

By default, the NetWorker server assigns the following privileges:

- ◆ **Administrators group**

Members of the Administrators group have privileges to perform all NetWorker operations. The root user on the NetWorker server is always a member of this group and *cannot* be removed from the group.

- ◆ **Users group**

Members of the Users group have privileges to back up and recover local data and monitor NetWorker operations. They *cannot* view or edit configurations. When changing the default Users group configurations, ensure that the required privileges are assigned for the operations. Table 4 provides more details.

The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* provides detailed information about NetWorker user groups and privileges.

Task 5: Configure the NetWorker Client resource

Configure a NetWorker Client resource for the Sybase server as a backup client on the NetWorker server.

A NetWorker Client resource is a set of attributes assigned to the Sybase server host and stored on the NetWorker server. Before using the NMS software for Sybase backups and restores, configure the Client resource for the Sybase server host by using the NetWorker Management Console (NMC).

To configure the NetWorker Client resource for a Sybase server:

1. Review the descriptions of the Client resource attribute settings. See Table 4.

2. For Each Attribute In The Client resource, enter the appropriate information.

Note: If the NetWorker server software is installed on the Sybase server host, a Client resource for the Sybase server host is created automatically during the NetWorker software installation.

Table 4 NetWorker Client Resource attributes

Attribute	Description
Name	Hostname of the Sybase server host.
Backup Command	Name of a single customized nrsydb script to be used for a Sybase <i>scheduled</i> backup.
Browse Policy	Amount of time that the NetWorker server must retain an entry for a Sybase backup in the online client file index.
Group	NetWorker backup group to be used for a Sybase <i>scheduled</i> backup.
Remote Access	Fully qualified IP name of a remote system so that the Sybase server backs up to that remote system. Leave the attribute unmodified if either of the following operations are <i>not</i> required: <ul style="list-style-type: none"> • Backup from a cluster • Recovery to a host other than the one being backed up
Retention Policy	Minimum length of time that the NetWorker server maintains information about Sybase backup data in the online media database.
Save Set	Predefined save set to be used for a Sybase <i>scheduled</i> backup. <ul style="list-style-type: none"> • To specify a backup of all databases for the Sybase server, enter the Sybase server name in the save set list. For example: SYBASE : / Sybase_server • To back up selected databases for the Sybase server, include the database name in the save set list. You can specify more than one database by making separate save set entries for each database. For example: SYBASE : / Sybase_server/ database_server
Schedule	NetWorker backup schedule to be used for a Sybase <i>scheduled</i> backup.

The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* and NetWorker server Online Help provide more information on how to configure the NetWorker Client resource and its attributes.

Task 6: Configure the NetWorker Device resource

Configure a NetWorker Device resource for each storage device to be used for Sybase backup and restore. The NetWorker server uses a Storage device to:

- Write data during a Sybase backup
- Read data during a Sybase restore

To configure the NetWorker Device resource:

1. Complete any required autochanger or silo configuration procedures.
2. In the NetWorker server configuration, include a Device resource for each Sybase storage device used for backup and restore operations.
3. Ensure that each Sybase storage device contains a labeled and mounted volume.

To create, modify, or remove a Device resource, use NMC. The following documentation provides more information on storage devices and how to configure the NetWorker Device resource:

- ◆ *The EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide*
- ◆ NetWorker server Online Help
- ◆ *EMC Hardware Compatibility Guide* appropriate for the platform

Task 7: Configure NetWorker volume pools

Configure any required NetWorker Pool resources and corresponding Label Template resources.

For the NMS software, the valid pool types are:

- ◆ Backup
- ◆ Backup clone

By default, NMS directs the database and transaction log backups to the Default volume pool.

Use the procedures that follow to direct information to customized volume pools:

- ◆ [“How to direct data to a custom pool” on page 16](#)
- ◆ [“How to direct a transaction log to a custom pool” on page 16](#)
- ◆ [“How to direct data and transaction logs to the same pool” on page 16](#)

How to direct data to a custom pool

To specify that the NetWorker server backs up data to a pool other than the Default pool, set the following environment variable to the volume pool name in the **nsrsyb** script:

```
NSR_DATA_VOLUME_POOL
```

How to direct a transaction log to a custom pool

To specify that the NetWorker server backs up transaction logs to a pool other than the Default pool, set the following environment variable to the volume pool name in the **nsrsyb** script:

```
NSR_LOG_VOLUME_POOL
```

How to direct data and transaction logs to the same pool

To direct both full and incremental backups to the same volume pool, set the **-b** poolname option in the BACKUP_OPT variable in the **nsrsyb** script.

The **-b** poolname option overrides the settings for the following environment variables:

```
NSR_DATA_VOLUME_POOL
NSR_LOG_VOLUME_POOL
```

Task 8: Set the NMS environment variables

The procedure to set NMS environment variables differs for manual and scheduled backups.

Setting variables for manual backups and recovery

To run a manual backup, recovery, and consistency check, set the NMS environment variables in the same shell that runs the backup, recovery, and consistency check commands.

To set the environment variables:

1. Log in to the system by using the Sybase user ID.
2. For Sybase server, version 12.5 and later, change to the directory where Sybase ASE software is installed.
3. Run the **SYBASE.sh** or **SYBASE.csh** script.

For example, in C shell:

```
source ./SYBASE.csh
```

Note: The SYB_MAX_IOSIZE variable defines the maximum I/O size used by the Sybase Backup server API. If it is *not* defined, then the default minimum value of 2 KB (2048) is used.

Setting variables for scheduled backups

To run a scheduled backup, configure the NMS environment variables in the **nsrsyb** script. “[Environment variables in the nsrsyb script](#)” on page 41 provides detailed instructions.

Task 9: Set XBSA environment variables

The procedure to set the NetWorker XBSA environment variables differs for manual and scheduled backups:

- ◆ To run a manual backup, recovery, and consistency check, set the NetWorker XBSA environment variables in the same shell that runs the backup, recovery, and consistency check commands.
[Appendix B, “XBSA Variables,”](#) provides the valid NetWorker XBSA settings.
- ◆ To run a scheduled backup, configure the NetWorker XBSA environment variables in the **nsrsyb** script.

The **nsrsyb** script contains several NetWorker XBSA environment variable settings shared by the NetWorker software and the **libbms** shared library for backup tasks. The script is already configured to the default settings as described in [Appendix B, “XBSA Variables.”](#)

Task 10: Select the operating system user account

Before performing a backup, recovery, or consistency check operation:

1. Log in using the operating system user account for Sybase that was used to launch the Sybase Backup Server.



IMPORTANT

Do *not* use the root user account of the operating system to run the NMS nsrsybcc, nsrsybsv, or nsrsybrc command.

2. Ensure that read and write permissions are set for the /nsr/tmp directory. The NMS software uses the temporary directory to pass environment variables.

Alternatively, the environment variable `NSR_TEMPDIR` can be used to define a temporary directory other than the `/nsr/tmp` directory for the NMS software.

For example, to define the `NSR_TEMPDIR` environment variable:

- a. Log in as a Sybase user.
- b. In the home directory, create a temporary directory:

```
mkdir tmp
```

- c. Define the `NSR_TEMPDIR` environment variable:

```
NSR_TEMPDIR=$HOME/tmp
export NSR_TEMPDIR
```

Configuring the software in a cluster environment

NMS supports Sybase ASE software, versions 12.0 and 12.5, in an active/passive configuration.

To configure the NMS software in a cluster environment:

1. On each physical node in the cluster, install the NMS software. The *NetWorker Module for Sybase, Release 3.0, UNIX Version, Installation Guide* provides detailed instructions.
2. On the primary node where the shared disk is mounted, run the `nms_config` script. “[Task 1: Run the nms_config script](#)” on page 12 provides detailed instructions.
3. If the Sybase ASE binaries are installed on the local disk in the cluster, run the `nms_config` script on the secondary node. “[Task 1: Run the nms_config script](#)” on page 12 provides detailed instructions.
4. Perform the following NMS configuration steps:
 - “[Task 2: Set Sybase roles and permissions](#)” on page 13
 - “[Task 3: Configure the NetWorker server resource](#)” on page 13
 - “[Task 4: Configure NetWorker user groups](#)” on page 14
5. On the NetWorker server, create NetWorker Client resources for the following:
 - `clus_phys1`
 - `clus_phys2`
 - `clus_vir1`



IMPORTANT

In a cluster, the NetWorker server must be remote and *not* part of the cluster environment used for the Sybase server.

“[Task 5: Configure the NetWorker Client resource](#)” on page 14 provides information on how to configure a NetWorker Client resource.

6. Continue with the following configuration tasks:
 - “[Task 6: Configure the NetWorker Device resource](#)” on page 15
 - “[Task 7: Configure NetWorker volume pools](#)” on page 16
 - “[Task 8: Set the NMS environment variables](#)” on page 16
 - “[Task 9: Set XBSA environment variables](#)” on page 17

- “Task 10: Select the operating system user account” on page 17

The Sybase ASE HA documentation and the appropriate cluster vendor documentation provides information on Sybase ASE support in a cluster.

References for additional configuration

The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* and the NetWorker Online Help provide detailed information on the following topics:

- ◆ Configuring the Client resource
- ◆ Configuring the Device resource
- ◆ Configuring the Server resource
- ◆ Configuring storage nodes
- ◆ Enabling regular file system backups
- ◆ Labeling and mounting volumes

The *EMC Software Compatibility Guide* provides the complete list of the hardware and software that NetWorker software currently supports.

Dynamic loading of OCS library

NMS, Release 2.5 uses Open-Client Client Library and the other allied libraries like CS common library (OCS) to connect to the ASE server. The OCS library in turn connects to ASE dynamic libraries. However, different OCS versions are not compatible with each other.

NM, Release 3.0 uses the Open Client Server (OCS) library present on the user's machine and dynamically loads the OCS to connect to the Sybase server. The dynamic loading of OCS takes place during the installation of Sybase server. This eliminates the need for manual installation of a particular version of OCS.

- ◆ For Solaris and Linux, set the LD_LIBRARY_PATH environment variable to point to the OCS library. The variable LD_LIBRARY_PATH is platform-dependent.
- ◆ For HP-UX RISC and AIX, set the SHLIB_PATH environment variable to point to the OCS library.

This chapter describes how to configure and perform manual Sybase backups.

This chapter includes the following sections:

- ◆ About manual backups 22
- ◆ Performing manual backups in a noncluster environment 24
- ◆ Performing manual backups in a cluster environment 30
- ◆ Multistripe backups 32
- ◆ Threshold procedures 34
- ◆ Monitoring manual backups 35
- ◆ Stopping manual backups 36
- ◆ Removing failed backups 36

About manual backups

Use the NMS **nsrsybsv** command to back up the Sybase server and individual databases.

Unlike scheduled backups, manual backups do *not* automatically back up the NetWorker server's client file index database and the bootstrap save set. To ensure adequate protection for NetWorker server disaster recovery, perform a manual backup of the NetWorker server bootstrap after performing a manual backup of the Sybase server or databases. [“How to back up the NetWorker bootstrap and index” on page 30](#) provides more details.

To ensure that the recovery of Sybase system databases and user databases are as efficient as possible, always:

- ◆ Keep up-to-date printouts of the Sybase system tables: sysusages, sysdatabases, sysdevices, sysloginroles, and syslogins.
- ◆ Keep up-to-date printouts of the scripts for disk init and create databases.
- ◆ Back up the master database after performing actions such as initializing database devices, creating or altering databases, or adding a new server login.

Sybase documentation provides more information.

How to configure a manual backup operation

To configure a manual backup operation:

1. Log in using the user account for the operating system that was used to launch the Sybase Backup server.



IMPORTANT

Do *not* use the root user account for the operating system to run the NMS nsrsybsv and nsrsybcc commands.

2. Ensure that the NMS software is correctly configured. [“Configuring the software in a noncluster environment” on page 12](#) and [“Configuring the software in a cluster environment” on page 18](#) provide instructions.
3. Select the appropriate operating system user account. [“Task 10: Select the operating system user account” on page 17](#) provides details.
4. Before starting a manual backup, run a database consistency check. [“Performing a consistency check” on page 23](#) provides instructions.
5. When performing a manual backup, always use one of the following options to specify a NetWorker server:
 - The **-s** option with the **nsrsybsv** command
 - NSR_SERVER XBSA environment variable[“Task 9: Set XBSA environment variables” on page 17](#) provides information on XBSA environment variables.

If a NetWorker server is *not* specified, then the NMS software queries the `/nsr/res/servers` file to find an available NetWorker server. When the NetWorker server that matches the Client resource is found, the backed up data is transferred to that NetWorker server.

Performing a consistency check

Use the **nsrsybcc** command to perform the following consistency checks:

- ◆ **dbcc checkdb**
- ◆ **dbcc checkdb (skip_ncindex)**
- ◆ **dbcc checkcatalog**
- ◆ **dbcc checkalloc**
- ◆ **dbcc checkstorage**

If the consistency check option is *not* specified, then the **nsrsybcc** command:

- ◆ Performs the **dbcc checkstorage** check when the **dbccdb** database is set up.
- ◆ Performs the **dbcc checkcatalog**, **dbcc checkalloc**, and **dbcc checkdb** checks when the **dbccdb** database is *not* set up.

To perform a database consistency check:

1. Ensure that the NMS software is correctly configured. “[Configuring the software in a noncluster environment](#)” on page 12 and “[Configuring the software in a cluster environment](#)” on page 18 provide instructions.
2. Enter the **nsrsybcc** command and perform one of the following checks:

Note: [Appendix A, “NMS Commands,”](#) provides a list of the options and syntax for the **nsrsybcc** command.

- To perform a **dbcc checkdb** check, set the **-o ckdb** option.

For example:

```
nsrsybcc -U user_ID -P password -o ckdb
SYBASE:/Sybase_server/database_name
```

- To perform a **dbcc checkdb (skip_noindex)** check, set the **-o ckdbnoidx** option.

For example:

```
nsrsybcc -U user_ID -P password -o ckdbnoidx
SYBASE:/Sybase_server/database_name
```

- To perform a **dbcc checkcatalog** check, set the **-o ckcat** option.

For example:

```
nsrsybcc -U user_ID -P password -o ckcat
SYBASE:/Sybase_server/database_name
```

- To perform a **dbcc checkalloc** check, set the **-o ckal** option.

For example:

```
nsrsybcc -U user_ID -P password -o ckal
SYBASE:/Sybase_server/database_name
```

- To perform a **dbcc checkstorage** check, set the **-o ckstor** option. Ensure that **dbccdb** is set up.

For example:

```
nsrsybcc -U user_ID -P password -o ckstor
SYBASE:/Sybase_server/database_name
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *Sybase_server* is the Sybase server name.
- *database_name* is the name of the database on the Sybase server.

For details about performing a database consistency check, refer to the Sybase documentation.

Performing manual backups in a noncluster environment

The following section describes how to back up Sybase data in a noncluster environment:

- ◆ [“Performing full backups in a noncluster environment” on page 24](#)
- ◆ [“Performing incremental backups in a noncluster environment” on page 25](#)



IMPORTANT

To back up and recover NetWorker save sets, use the `nsrsybsv` and `nsrsybrc` commands, rather than the Sybase dump and load commands.

Performing full backups in a noncluster environment

A full NMS backup sends the **dump** database command to Sybase, which backs up the entire database (that is, both the data and the transaction log). When incremental backups are *not* allowed for a database, the NMS software truncates the inactive portion of the transaction log.

Use the **nsrsybsv** command to perform full backups of database on the Sybase server.

How to perform a full backup of one database

To perform a full backup of one database, enter the following command:

```
nsrsybsv -U user_ID -P password -s networker_server -l full
SYBASE:/Sybase_server/database_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the name of the NetWorker server.
- ◆ *Sybase_server* is the Sybase server name.
- ◆ *database_name* is the name of the database on the Sybase server.

How to perform a full backup of the Sybase server

To perform a full backup of the Sybase server, enter the following command:

```
nsrsybsv -U user_ID -P password -s networker_server -l full
SYBASE:/Sybase_server
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the name of the NetWorker server.

- ◆ *Sybase_server* is the Sybase server name.

How to perform a full backup of multiple databases

To perform a full backup of two or more databases at the same time, enter the following command:

```
nrsybsv -U user_ID -P password -s networker_server -l full
SYBASE:/Sybase_server/database1_name
SYBASE:/Sybase_server/database2_name
SYBASE:/Sybase_server/database3_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the name of the NetWorker server.
- ◆ *Sybase_server* is the Sybase server name.
- ◆ *database1_name*, *database2_name*, and *database3_name* are the names of a database on the Sybase server. The `nrsybsv` command backs up three databases that belong to the same Sybase server.

Performing incremental backups in a noncluster environment

A NMS incremental backup calls the Sybase `dump` command that backs up the transaction log and truncates the inactive portion of the transaction log.



CAUTION

Before performing an incremental backup, ensure that a full backup of the database exists. If a full backup does *not* exist or is removed from the NetWorker server, and an incremental backup is attempted, the restore fails.

How to perform an incremental backup of one database

To perform an incremental backup of one database, enter the following command:

```
nrsybsv -U user_ID -P password -s networker_server -l incr
SYBASE:/Sybase_server/database_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the name of the NetWorker server.
- ◆ *Sybase_server* is the Sybase server name.
- ◆ *database_name* is the name of the database on the Sybase server.

How to perform an incremental backup of the Sybase server

To perform an incremental backup of the Sybase server, enter the following command:

```
nrsybsv -U user_ID -P password -s networker_server -l incr
SYBASE:/Sybase_server
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.

- ◆ *networker_server* is the name of the NetWorker server.
- ◆ *Sybase_server* is the Sybase server name.



IMPORTANT

If an incremental backup is performed on the Sybase server, only the transaction log for each database is backed up.

If the database is *not* configured for an incremental backup, an error message appears and the transaction log is *not* backed up.

Customizing a backup

This section provides information on customizing a backup and includes the following topics:

- ◆ [“How to exclude databases from a Sybase server backup” on page 26](#)
- ◆ [“How to direct a backup to a specific NetWorker pool” on page 26](#)
- ◆ [“How to use advanced options to back up transaction logs” on page 27](#)
- ◆ [“How to back up the NetWorker bootstrap and index” on page 30](#)

How to exclude databases from a Sybase server backup

Set the **-X** option to specify the full path of the exclude file when backing up a Sybase server. Do *not* use the **-X** option when backing up a single or multiple databases.

To exclude databases when backing up a Sybase server:

1. Create an ASCII file. This file is used as an exclude file.
2. In the file, add one entry for each database that is to be excluded. Use the following command:

```
SYBASE: /Sybase_server/database_name
```

where:

- *Sybase_server* is the Sybase server name.
 - *database_name* is the name of the database on the Sybase server.
3. Set the **-X** option to specify the path to the *exclude* file:

```
nsrsybsv -U user_ID -P password -s networker_server  
-X fullpath_of_exclude_file SYBASE: /Sybase_server
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the name of the NetWorker server.
- *fullpath_of_exclude_file* is the full path of the exclude file.
- *Sybase_server* is the Sybase server name.

How to direct a backup to a specific NetWorker pool

By default, backups initiated with the **nsrsybsv** command write data to the Default pool on the NetWorker server. Use the **-b** option to direct Sybase data to a specific volume pool.

To direct a backup to a specific NetWorker pool:

```
nrsybsv -U user_ID -P password -s networker_server -b pool_name  
SYBASE:/Sybase_server
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the name of the NetWorker server.
- ◆ *pool_name* is the name of the NetWorker pool.
- ◆ *Sybase_server* is the Sybase server name.

How to use advanced options to back up transaction logs

Use the following options with the NMS backup command to back up transaction logs:

- ◆ The **-G** (with `no_log`) option backs up the transaction log *without* recording the backup operation.
- ◆ The **-R** (`no_truncate`) option backs up the transaction log *without* truncating it.
- ◆ The **-T** (`truncate_only`) option truncates the transaction log *without* backing it up.

The Sybase documentation provides information about how and when to use the backup command options.

The following sections describe how to perform transaction log backups on the same or separate devices:

- [“Full backups on the same or separate device” on page 28](#)
- [“Incremental backups on the same or separate device” on page 29](#)

Full backups on the same or separate device

[Table 5](#) provides information about how the various backup options impact backup of database and transaction logs, depending whether they are on the same or separate devices.

Table 5 Backup options for full backups

Command options	NMS software response on separate devices	NMS software response on same device
-G with no_log	<ol style="list-style-type: none"> 1. Truncates the transaction log <i>without</i> logging the transaction. 2. Performs a full backup. 	<ol style="list-style-type: none"> 1. Displays an error message stating that -G is <i>not</i> a valid option and the backup operation is ignored. 2. Performs a full backup, which also truncates the transaction log.
-R no_truncate	<ol style="list-style-type: none"> 1. Backs up the transaction log but does <i>not</i> truncate it. 2. Performs a full backup. 	Performs a full backup, but does <i>not</i> truncate the transaction log.
-T truncate_only	<ol style="list-style-type: none"> 1. Truncates the database log. 2. Performs a full backup. 	<ol style="list-style-type: none"> 1. Truncates the database log. 2. Performs a full backup.
no option	Performs a full backup.	Performs a full backup, but does not truncate the transaction log.
For read only databases		
-G with no_log	<ol style="list-style-type: none"> 1. Truncates the transaction log <i>without</i> logging the transaction. 2. Performs a full backup. 	<ol style="list-style-type: none"> 1. Displays an error message stating that -G is <i>not</i> a valid option and the backup operation is ignored. 2. Performs a full backup, which also truncates the transaction log.
-T	Displays an error message stating that the -T option is not a valid option for read only databases.	Displays an error message stating that the -T option is not a valid option for read only databases.
-R no_truncate	<ol style="list-style-type: none"> 1. Backs up the transaction log but does <i>not</i> truncate it. 2. Performs a full backup. 	Performs a full backup, but does <i>not</i> truncate the transaction log.
no option	Performs a full backup.	Performs a full backup, but does not truncate the transaction log.

Incremental backups on the same or separate device

The three backup options (-G, -R, -T) are *not* valid for incremental backups of data and transaction logs on the same device.

- ◆ When backing up an entire database, the NMS:
 1. Displays a message stating that it is unable to perform an incremental backup, and skips this backup.
 2. Performs an incremental backup of any databases that exist on different devices.
- ◆ When backing up a single database, the NMS:
 1. Displays a message stating that it is unable to perform an incremental backup.
 2. Performs a full backup.

Table 6 provides details about the various backup options impact backup of database and transaction logs on separate devices.

Table 6 Options for incremental backups

Options	NMS software response on separate devices
-G with no_log	<ol style="list-style-type: none"> 1. Displays an error message stating that the -G option is not supported with incremental backups, and that a full backup must be performed instead. The following error message appears: "Error: the '-G' option is not valid for an incremental backup where the log is on a separate device. It will be ignored. To truncate the transaction log without logging it, use the same command with a level of full instead of incremental." 2. Performs an incremental backup.
-T truncate_only	<ol style="list-style-type: none"> 1. Displays an error message stating that the -T option is not supported with incremental backups, and that a full backup must be performed instead. 2. Performs an incremental backup.
-R no_truncate	Backs up the transaction log, but does <i>not</i> truncate it.
no option	Performs an incremental backup.
For read only databases	
-G with no_log	<ol style="list-style-type: none"> 1. Displays an error message stating that the -G option is not supported with incremental backups, and that a full backup must be performed instead. The following error message appears: "Error: the '-G' option is not valid for an incremental backup where the log is on a separate device. It will be ignored. To truncate the transaction log without logging it, use the same command with a level of full instead of incremental." 2. Performs an incremental backup.
-T truncate_only	<ol style="list-style-type: none"> 1. Displays an error message stating that the -T option is not a valid option for read only databases. The following error message appears: "Unable to truncate the transaction log for database <db_name> as the database is read-only. Dump of database <db_name> aborted." 2. Does not perform an incremental backup.
-R no_truncate	Backs up the transaction log, but does not truncate it.
no option	Performs an incremental backup.

How to back up the NetWorker bootstrap and index

The NetWorker server automatically performs a backup of its bootstrap and the client file index of the Sybase server, but this backup takes place only at the end of a *scheduled* Sybase backup and not a manual backup.

After a Sybase manual backup is complete, the bootstrap and client index must be backed up because these files are required for disaster recovery of the NetWorker server.

To back up the NetWorker bootstrap and index:

1. On the NetWorker server, log in as root.
2. Enter the following command:

```
savegrp -O -l full -P printer_name -c networker_client
-c networker_server
```

where:

- *printer_name* is the name of the printer where the bootstrap information is printed at the end of the bootstrap backup.
 - *networker_client* is the hostname of the NetWorker client where the Sybase server is running.
 - *networker_server* is the hostname of the NetWorker server.
3. Store the bootstrap printout in a safe place.

The printed bootstrap information includes dates, locations, and save set ID numbers of the bootstrap save sets that were backed up during the past month. With this information you can determine which volumes are needed to recover the NetWorker indexes and resource configuration files during a disaster recovery.

Performing manual backups in a cluster environment

The following describes how to perform manual backups of a Sybase database in a cluster environment and includes the following topics:

- ◆ [“Performing full backups in a cluster environment” on page 30](#)
- ◆ [“Performing incremental backups in a cluster environment” on page 31](#)



IMPORTANT

To back up and recover NetWorker save sets, use the `nsrsybsv` and `nsrsybrc` commands, rather than the Sybase dump and load commands.

Performing full backups in a cluster environment

This section describes how to perform full backups of the Sybase server.

- ◆ [“How to perform a full backup of one database” on page 30](#)
- ◆ [“How to perform a full backup of the Sybase server” on page 31](#)

How to perform a full backup of one database

To perform a full backup of one database:

1. Log in to the virtual node in the cluster.
2. Enter the following command:

```
nrsrsybsv -U user_ID -P password -s networker_server -l full
-c clus_vir1 SYBASE:/Sybase_server/database_name
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the hostname of the NetWorker server.
- *clus_vir1* is the hostname of the virtual node in the cluster.
- *Sybase_server* is the Sybase server name.
- *database_name* is the name of the database on the Sybase server.

How to perform a full backup of the Sybase server

To perform a full backup of the Sybase server:

1. Log in to the virtual node in the cluster.
2. Enter the following command:

```
nrsrsybsv -U user_ID -P password -s networker_server -l full
-c clus_vir1 SYBASE:/Sybase_server
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the hostname of the NetWorker server.
- *clus_vir1* is the hostname of the virtual node in the cluster.
- *Sybase_server* is the Sybase server name.

Performing incremental backups in a cluster environment

This section describes how to perform incremental backups of the Sybase server.

- ◆ [“How to perform an incremental backup of one database” on page 31](#)
- ◆ [“How to perform an incremental backup of the Sybase server” on page 32](#)

How to perform an incremental backup of one database



IMPORTANT

Before performing an incremental backup, ensure that a full backup exists. If a full backup of a database does *not* exist or is removed from the NetWorker server, and an incremental backup is attempted, the restore fails.

To perform an incremental backup of one database:

1. Log in to the virtual node in the cluster.
2. Ensure that a full backup exists.
3. Enter the following command:

```
nsrsybsv -U user_ID -P password -s networker_server -l incr
-c clus_vir1 SYBASE:/Sybase_server/database_name
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the hostname of the NetWorker server.
- *clus_vir1* is the hostname of the virtual node in the cluster.
- *Sybase_server* is the Sybase server name.
- *database_name* is the name of the database on the Sybase server.

How to perform an incremental backup of the Sybase server



IMPORTANT

Before performing an incremental backup, ensure that a full backup exists. If a full backup of a database does *not* exist or is removed from the NetWorker server, and an incremental backup is attempted, the restore fails.

To perform an incremental backup of the Sybase server:

1. Log in to the virtual node in the cluster.
2. Ensure that a full backup exists.
3. Enter the following command:

```
nsrsybsv -U user_ID -P password -s networker_server
-l incr -c clus_vir1 SYBASE:/Sybase_server
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the hostname of the NetWorker server.
- *clus_vir1* is the hostname of the virtual node in the cluster.
- *Sybase_server* is the Sybase server name.

Multistripe backups

The NMS software supports the use of multistripe sessions for the backup of Sybase server data. Multistripe backups are one or more streams of data that can be extracted in parallel from a database, and written in parallel to one or more media devices.

Multistripe backups for ASE version 12.5.4 are not supported by NMS, Release 3.0.

With the NMS software, multistripe backups can enhance performance significantly when a large amount of data is backed up by using multiple tape drives. The **nsrsybsv** command **-S** option specifies the number of sessions.

The multistripe backup feature does *not* support the backup of transaction logs (incremental backups). If the multistripe backup option is used for incremental backups, the NMS software automatically converts the backup to a normal incremental backup.

How to configure a multistripe backup

To configure a multistripe backup, use NMC to set the following:

- ◆ NetWorker server parallelism
- ◆ NetWorker client parallelism
- ◆ Target sessions for each physical devices to be used by multistripe backup

The steps for these tasks are as follows:

1. Start the NMC.
2. Set the server parallelism:
 - a. Select **Server > Server Setup**.
 - b. Set the **Parallelism** attribute to at least one more than the number of sessions used during the backup.

For example, if three sessions are used, specify a value of four or greater for the parallelism.
3. Set the client parallelism:
 - a. Select **Client > Client Setup**.
 - b. Set the **Parallelism** attribute to the same or more than the number of sessions used during the backup.

For example, if three sessions are used, specify a value of three or greater for the parallelism.

4. Create devices for multistripe backup.

For example, if three sessions are used, create three devices.

5. Set the device target sessions:
 - a. Select **Media > Devices**.
 - b. Set the **Target Sessions** attribute to **1 per device**.

The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* provides more information about these attributes.

6. Determine the number of sessions for multistripe backup by using the following rules:
 - The number of sessions must *not* be greater than NetWorker server parallelism.
 - The number of sessions must *not* be greater than the total number of target sessions for devices to be used by multistripe backup.

The *NetWorker Performance Tuning Guide* provides more information about how to achieve optimum performance in a production environment.

Perform a multistripe backup

To perform a multistripe backup of one database, enter the following command:

```
nrsrsvsv -U user_ID -P password -s networker_server -l full -S sessions
SYBASE:/Sybase_server/database_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the name of the NetWorker server.
- ◆ *sessions* is the number of sessions for multistripe backup
- ◆ *Sybase_server* is the Sybase server name.
- ◆ *database_name* is the name of the database on the Sybase server.

Threshold procedures

A threshold procedure is configured to perform as follows:

- ◆ When the threshold is reached, the NMS software dumps the transaction log.
- ◆ If a dump of the transaction log is *not* allowed, then the NMS software performs a full database dump and truncates the transaction log.



IMPORTANT

If the threshold procedure or the isql command line is used for transaction log backups, set the environment variables in the shell that launches the Sybase Backup Server. This overrides the default settings for the NetWorker XBSA environment variables.

If the NMS software *cannot* perform a full database dump, then do either of the following:

- ◆ Add space to the transaction log.
- ◆ Abort processes that were suspended when the threshold was crossed.

The Sybase documentation provides detailed information on thresholds.

Sample threshold procedure

Use the sample threshold procedure described in this section to implement transaction log backups to free log space. Edit the sample threshold procedure to suit the environment.

[Table 7](#) lists the default location for the sample threshold procedure:

Table 7 Threshold procedure location

Platform	Location
AIX	/usr/bin/threshold.sql
HP-UX	/opt/networker/bin/threshold.sql
Solaris	/usr/sbin/threshold.sql
Linux	/usr/sbin/threshold.sql

Install the sample threshold procedure in a database

To use the sample threshold procedure:

1. Edit the threshold.sql file and add the word *go* to the last line of the file.
2. Run the **isql** command and use threshold.sql as an input file:

```
isql -Usa -P password -S Sybase_server -D database_name
-i threshold.sql
```

where:

- *password* is the password of the Sybase SA account.
- *Sybase_server* is the name of the Sybase server.
- *database_name* is the name of the Sybase database.

3. Start an **isql** session and verify that the threshold procedure is in place:

```
isql -Usa -P password -S Sybase_server -D database_name
1> sp_help
2> go
```

The procedure **sp_thresholdaction** must appear when the **sp_help** command is run. If it does *not* appear, then verify that the database used is the correct one.

The Sybase documentation provides instructions about how to use the **sp_addthreshold** command to do the following:

- ◆ Add the NMS threshold procedure to the Sybase server.
- ◆ Manage free space with thresholds.

Monitoring manual backups

You can monitor the status of backup and recovery operations:

- ◆ During a backup or recovery operation, the progress messages appear.
- ◆ After a backup or recovery operation is finished, the completion message appears.
- ◆ If a backup or recovery operation does *not* proceed, the status information appears.

View the results of a backup

To view the results of a NMS backup operation, use one the following methods:

- ◆ [“NetWorker Management Console” on page 35](#)
- ◆ [“Debug file” on page 35](#)
- ◆ [“nsrinfo command” on page 36](#)
- ◆ [“mminfo command” on page 36](#)

NetWorker Management Console

NMC displays progress and completion messages that advise when a backup or restore is complete, and information explaining why a backup or restore cannot proceed. The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* provides more information about how to use the NMC to view these messages.

Debug file

Messages explaining when a backup or restore is complete, or why a backup or restore is not complete, are logged in the debug file, <binary_name>.<PID>.dbg, where *binary_name* is the process name and *PID* is the process ID.

nsrinfo command

To view the results of manual and scheduled backups, use the **nsrinfo** command to check the NetWorker client file index on the NetWorker server.

For example:

```
nsrinfo -s networker_server -n sybase client_name
```

where:

- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *networker_client* is the hostname of the computer where the database resides.

mminfo command

To view the results of manual and scheduled backups, use the **mminfo** command to check the NetWorker media index on the NetWorker server.

For example:

```
mminfo -s networker_server -avot -c client_name
```

where:

- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *networker_client* is the hostname of the computer where the database resides.

The following sources provide complete information about using the **nsrinfo** and **mminfo** commands:

- ◆ The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide*
- ◆ The **nsrinfo** and **mminfo** man pages

Stopping manual backups

Stopping a manual backup while it is running is *not* recommended. Follow these steps to ensure that the data is recoverable.

To stop a backup while it is running:

1. From the command line, press Ctrl+c to stop the manual backup.
2. Once the manual backup stops, perform a full manual backup of the database.

Removing failed backups

If a backup fails, manually remove it from the NetWorker server's media database.



IMPORTANT

Restoring a failed backup results in error.

To manually remove a failed backup:

1. If required, use the **mminfo** command on the NetWorker server to determine if the record for the failed backup is in the NetWorker media database.

For example:

```
mminfo -s networker_server -v -c networker_client
```

where:

- *networker_server* is the hostname of the NetWorker server.
- *networker_client* is the hostname of the computer where the database resides.

Note: In a cluster environment, use the virtual hostname for the Sybase server.

2. Use the output of the **mminfo** command to determine if a save set was created for the failed backup and was *not* automatically removed by the NetWorker server.

To remove the save set:

- a. Note the save set ID (*ssid*).

The *ssid* environment variable is the save set from the output of the **mminfo** command.

- b. Enter the **nsrmm** command to remove the save set from the media database.

For example:

```
nsrmm -s networker_server -S ssid -d
```

where:

- *networker_server* is the hostname of the NetWorker server.
- *ssid* is the NetWorker save set ID.

This chapter describes how to perform and configure scheduled Sybase backups. It outlines the procedures for testing and monitoring scheduled backups that use the NMC.

This chapter includes the following sections:

- ◆ About scheduled backups..... 40
- ◆ Configuring scheduled backups in a noncluster environment 40
- ◆ Configuring scheduled backups in a cluster environment 46
- ◆ Monitoring scheduled backups..... 48
- ◆ Stopping scheduled backups..... 50
- ◆ Removing failed backups..... 50

About scheduled backups

You can configure the NMS software to perform full or incremental Sybase backups on a regular basis, by setting up a NetWorker backup schedule.

To ensure that the recovery of Sybase system databases and user databases are as efficient as possible, always:

- ◆ Keep up-to-date printouts of the Sybase system tables: sysusages, sysdatabases, sysdevices, sysloginroles, and syslogins.
- ◆ Keep up-to-date printouts of the scripts for disk init and create databases.
- ◆ Back up the master database after performing actions such as initializing database devices, creating or altering databases, or adding new server login.

Sybase documentation provides more information.



IMPORTANT

Before configuring and running a scheduled backup, run a manual backup to test the backup configuration. [Chapter 3, "Performing Manual Backups,"](#) provides instructions to run a manual backup.

Configuring scheduled backups in a noncluster environment

To configure scheduled Sybase backups in a noncluster environment:

1. Designate at least one computer on the network as the NetWorker server.
2. Configure the computers with Sybase data to back up as clients of the NetWorker server.
3. Ensure that the NMS software has been correctly configured. The following sections provide instructions:
 - ["Configuring the software in a noncluster environment" on page 12](#)
 - ["Configuring the software in a cluster environment" on page 18](#)
4. Complete the tasks that are outlined in the following sections:
 - ["Task 1: Customize the nsrsyb script for scheduled backups" on page 40](#)
 - ["Task 2: Configure a NetWorker backup schedule" on page 44](#)
 - ["Task 3: Configure a NMS group" on page 44](#)
 - ["Task 4: Configure NetWorker volume pools" on page 45](#)
 - ["Task 5: Configure the client resource for a scheduled Sybase backup" on page 45](#)

["Monitoring scheduled backups" on page 48](#) provides information about how to track the status of scheduled backups.

Task 1: Customize the nsrsyb script for scheduled backups

For each NetWorker client, customize the **nsrsyb** script on the Sybase server host by modifying the environment variables in the script.

There are two ways to customize the script to control backups of different instances of the Sybase server:

- ◆ Modify the options in the existing **nsrsyb** script, which is stored in the NMS installation directory.
- ◆ Create a new copy of the **nsrsyb** template file, `nsrsyb.sh`, and customize the file. [“How to create a customized version of the nsrsyb template file” on page 41](#) provides more details.

How to create a customized version of the nsrsyb template file

To create a customized version of the **nsrsyb** template file on the NetWorker client where the Sybase server is running:

1. Copy the `nsrsyb.sh` template file with a different name to where the NMS files are installed. The `nsrsyb.sh` template file is located in the `/etc` directory. Do *not* modify this template file.

Note: The name of the copied file must begin with either `nsr` or `save`. For example, `nsr_pubs2`.



IMPORTANT

All versions of the nsrsyb script must be located in the same directory as the NetWorker executables. Do *not* move the nsrsyb script to a different directory.

2. Open the new file for editing.
3. If required, add the NMS environment variables:

In the environment variable section.

- a. Add additional NMS environment variables.
- b. Add the NMS environment variable to the list of exported variables.

[“Environment variables in the nsrsyb script” on page 41](#) provides a list of the environment variables that can be set in the `nsrsyb` script.

4. If the NMS software is *not* installed in the default location, change the `PATH=` variable to the location where the NetWorker client binary files are installed.

The default location for the NetWorker client binary files is the following:

- AIX: `/usr/bin`
- HP-UX: `/opt/networker/bin`
- Solaris: `/usr/sbin`
- Linux: `/usr/sbin`

By default, the NMS software is installed in the same location as the NetWorker client software.

Environment variables in the nsrsyb script

The following sections describe all the environment variables that can be set in the **nsrsyb** script for scheduled backups. The comments in the **nsrsyb** script file provide details on these variables.

The environment variables in the `nsrsyb` script are as follows:

- ◆ [“BACKUP_OPT variable” on page 42](#)
- ◆ [“DBCCOPT variable” on page 42](#)

- ◆ “POSTCMD variable” on page 42
- ◆ “PRECMD variable” on page 42
- ◆ “USE_CONSISTENCY_CHECK variable” on page 43
- ◆ “SYBASE variable” on page 43
- ◆ “NSR_DEBUG_FILE variable” on page 43
- ◆ “NSR_SAVESET_NAME variable” on page 43
- ◆ “NSR_ASE_PASSWORD variable” on page 43
- ◆ “XBSA environment variables” on page 43

BACKUP_OPT variable

This optional environment variable passes additional options to the **nsrsybsv** command within the **nsrsyb** script.

For example, if a customized volume pool was created for the Sybase backups, the **-b** option directs the database and transaction log backups to the same volume pool.

```
BACKUP_OPT="-b sybasepool"
```

Notes:

- ◆ Do *not* use the **-N**, **-g**, or **-s** option with the **nsrsybsv** command.
- ◆ Before performing a scheduled backup using the **-x** option, ensure that a full scheduled backup of the Sybase server has been performed.

[Appendix A, “NMS Commands,”](#) provides more details.

DBCCOPT variable

This optional environment variable passes the following additional options to the **nsrsybcc** command within the **nsrsyb** script:

- ◆ **-o ckdb**
- ◆ **-o ckal**
- ◆ **-o ckcat**
- ◆ **-o ckdbnoidx**
- ◆ **-o ckstor**

For example:

```
DBCCOPT= "-o ckdb"
```

[Appendix A, “NMS Commands,”](#) provides more details.

POSTCMD variable

This variable points to a file containing a postprocessing script that runs after a scheduled backup.

- ◆ If the backup fails, the failure is reported and the **POSTCMD** script runs.
- ◆ If the **POSTCMD** script fails, an error message reports the failure.

Note: Make sure that the root user has permission to run the **POSTCMD** script.

PRECMD variable

This variable points to a file containing a preprocessing script that runs before a scheduled backup.

If the **PRECMD** script:

- ◆ Fails, the scheduled backup is *not* started and an error message reports the failure. The **POSTCMD** script however, still runs.

- ◆ Succeeds, the scheduled backup starts. The **POSTCMD** script runs after the backup.

Note: Make sure that the root user has permission to run the **PRECMD** script.

USE_CONSISTENCY_CHECK variable

This variable runs the `nsrsybcc` database consistency check command before a backup occurs. It creates a **PRECMD** with the appropriate arguments for the `nsrsybcc` command.

If the **USE_CONSISTENCY_CHECK** and the **PRECMD** variables are both set, the commands in the **PRECMD** variable override the commands in the **USE_CONSISTENCY_CHECK** variable.

SYBASE variable

This variable points to the directory where Sybase is installed. The **Sybase** variable in the `nsrsyb` script can be set to include the complete directory path to Sybase.

For ASE version 12.5 and later, set this variable to the directory where Sybase ASE software is installed.

For example:

```
SYBASE=/space2/sybase125
```

NSR_DEBUG_FILE variable

This variable is set so that errors are written to the debug log file. “[Exclusion of multiple user-defined temporary databases from backup](#)” on page 9 and “[Improved reporting of scheduled backups](#)” on page 48 provide more details.

NSR_SAVESET_NAME variable

This variable indicates the save set name, NetWorker XBSA should use for a save session. “[NSR_SAVESET_NAME](#)” on page 74 provides more information.

NSR_ASE_PASSWORD variable

This variable is used to set the desired password. “[Password-protected database backup and restore](#)” on page 8 provides more information.

XBSA environment variables

NetWorker XBSA environment variables allow for configuration of environment options to activate certain features of NetWorker software that are *not* directly supported by X/Open specifications. NetWorker XBSA and the `libbms` shared library enable the Sybase Backup Server API and the NetWorker software to interact during backup and recover operations.



IMPORTANT

If the threshold procedure or the `isql` command line is used for transaction log backups, the environment variables must be set in the shell that launches the Sybase Backup Server to override the default settings for the NetWorker XBSA environment variables.

Note: Do *not* use the following XBSA variables in the `nsrsyb` script: `NSR_SERVER`, `NSR_GROUP`, and `NSR_SAVESET_NAME`.

The NetWorker XBSA settings in the `nsrsyb` script can be modified to any of the valid values. [Appendix B, “XBSA Variables,”](#) provides more details.

Task 2: Configure a NetWorker backup schedule

Create a schedule for Sybase server backups. There are two methods that can be used to create a backup schedule:

- ◆ NMC provides a graphical calendar to assist in configuring backup schedules. The calendar indicates the days of the week when each scheduled Sybase backup runs and the level of the backup.
- ◆ The NetWorker server provides several preconfigured schedules. These schedules can be modified, or a new schedule can be created.

The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* provides information on how to configure a Schedule resource.

NMS backup levels

The NMS software translates valid NetWorker levels to Sybase **dump** commands as shown in [Table 8](#).

Table 8 NMS backup level translations

NetWorker	Sybase Server	NMS software response
Full	Dump database	Full backup of a database and its transaction logs.
Incremental	Dump transaction log	Backup of all changes to the database since the last dump.
1-9	Not valid	Failed backup with an error message.
Consolidate	Not valid	Failed backup with an error message.
Skip	Skip	Skips the scheduled backup.

Incremental backup considerations

The following apply to incremental backups:

- ◆ If an incremental backup has been scheduled, but a full backup has never been completed, the NetWorker software performs a full backup instead of an incremental backup.
- ◆ If an incremental backup is performed on the Sybase server, only the transaction log for each database will be backed up.
- ◆ If the database has *not* been configured for an incremental backup, an error message is displayed and the transaction log is *not* backed up.

Task 3: Configure a NMS group

Create backup groups for the server instances with different start times to help reduce network traffic. Any number of backup groups can be configured on the NetWorker server. When selecting the start times for each group, be sure to schedule them far enough apart so that one group completes its backup before the next group starts.

The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* provides instructions that explain how to set up a backup group.

Task 4: Configure NetWorker volume pools

By default, NMS directs the database and transaction log backups to the Default volume pool.

Use the procedures that follow to direct information to customized volume pools:

- ◆ [“How to direct data to a custom pool” on page 45](#)
- ◆ [“How to direct a transaction log to a custom pool” on page 45](#)
- ◆ [“How to direct data and transaction logs to the same pool” on page 45](#)

How to direct data to a custom pool

To specify that the NetWorker server backs up data to a pool *other* than the Default pool, set the following environment variable to the volume pool name in the **nsrsyb** script:

```
NSR_DATA_VOLUME_POOL
```

How to direct a transaction log to a custom pool

To specify that the NetWorker server backs up transaction logs to a pool *other* than the Default pool, set the following environment variable to the volume pool name in the **nsrsyb** script:

```
NSR_LOG_VOLUME_POOL
```

How to direct data and transaction logs to the same pool

To direct both full and incremental backups to the same volume pool, set the **-b** poolname option in the BACKUP_OPT variable in the **nsrsyb** script.

The **-b** poolname option overrides the settings for the following environment variables:

```
NSR_DATA_VOLUME_POOL
NSR_LOG_VOLUME_POOL
```

Task 5: Configure the client resource for a scheduled Sybase backup

For scheduled backups, additional attributes must be specified in the Client resource for each database instance.

To complete the Client resource configuration for scheduled backups:

1. For each Sybase server, use the NMC to modify the Client resource. [Table 9](#) provides details.
2. If multiple instances of the Sybase server exist on a computer, configure a separate NetWorker Client resource for each Sybase server.

Table 9 NetWorker client resource attributes

Attribute	Entry
Name	Hostname of the Sybase server host.
Backup Command	Name of a single customized nsrsyb script. For example, nsrsyb or nsrsyb2.
Browse Policy	Length of time that the NetWorker server retains an entry for a Sybase backup in the online client file index.
Group	NetWorker backup group.

Table 9 NetWorker client resource attributes (continued)

Attribute	Entry
Remote Access	Fully qualified IP name of a remote system so that the Sybase server backs up to that remote system. Leave the attribute unmodified if either of the following are <i>not</i> required: <ul style="list-style-type: none"> • Backup from a cluster. • Recovery to a host other than the one being backed up.
Retention Policy	Minimum length of time that the NetWorker server maintains information about Sybase backup data in the online media database.
Save Set	Complete pathname of files, file systems, or predefined save set to be used for a <i>scheduled</i> Sybase backup. <ul style="list-style-type: none"> • To back up the entire Sybase server, specify the Sybase server name. For example: SYBASE:/Sybase_servername • To back up a specific database for the Sybase server instance, include the database name in the save set string. For example: SYBASE:/Sybase_servername/database_name • To back up more than one database, add a separate save set entry for each database.
Schedule	NetWorker backup schedule.
Remote User	Sybase username.
Password	Sybase password.
Directives	Leave blank. The nsrsyb script controls data compression.
Archive	Leave blank. The nsrsyb script controls data compression.
Aliases	All known aliases for the computer that runs the Sybase server. For example: venus venus.acme.com

Configuring scheduled backups in a cluster environment

In the following procedure, primary node *clus_phys1* and secondary node *clus_phys2* are clustered together to form virtual node *clus_vir1*. The Sybase ASE server and the Sybase Backup Server have been set up in an active/passive configuration. The failover can be performed from either node in the cluster.

To configure the NMS software in a cluster environment:

1. On each node in the cluster, install the NMS software. The *NetWorker Module for Sybase, Release 3.0, UNIX Version, Installation Guide* provide detailed instructions.
2. On the primary node where the shared disk is mounted, run the **nms_config** script. “[Task 1: Run the nms_config script](#)” on page 12. provides detailed instructions.
3. If the Sybase ASE binaries are installed on the local disk in the cluster, run the **nms_config** script on the secondary node. “[Task 1: Run the nms_config script](#)” on page 12 provides detailed instructions.
4. On each node in the cluster, customize the **nsrsyb** script for scheduled backups:
 - a. Create a customized version of the **nsrsyb** script. “[Task 1: Customize the nsrsyb script for scheduled backups](#)” on page 40 provides detailed instructions.

- b. For the **BACKUP_OPT** option, add the following:


```
-c clus_vir1
```
- c. Ensure that all the copies of the **nsrsyb** script files are the same.
5. On the NetWorker server, create a Client resource for each of the following:
 - clus_vir1
 - clus_phys1
 - clus_phys2
6. For *clus_vir1*, edit the Client resource:
 - a. In the Remote access attribute, set the following values:


```
user=sybase,host=clus_phys1
user=sybase,host=clus_phys2
```
 - b. In the Remote User attribute, specify the name of the Sybase user for database backup tasks.
 - c. In the Password attribute, specify the password of the Sybase user for database backup tasks.
 - d. In the Backup Command attribute, specify the filename for the **nsrsyb** script.
 - e. In the Save Set attribute, specify the Sybase server to be backed up.
7. For each physical host in the cluster (*clus_phys1* and *clus_phys2*), edit the Client resource:
 - a. In the Save Set attribute, specify the Sybase server to be backed up.
 - b. Ensure that the value of the Save Set attribute is the same as the value of the save set string for *clus_vir1*.
8. For *clus_vir1*, assign the NetWorker Client resource to a backup group that has been configured for a scheduled backup.

The Sybase ASE HA documentation and the appropriate cluster vendor documentation provide information on Sybase ASE support in a cluster.

Testing scheduled backups

Once the NetWorker server is correctly configured for scheduled backups, test the scheduled backup as follows:

1. Log in as root on the NetWorker server.
2. Start the NMC.
3. Select **Server > Group Control** to open the **Group Control** window.
4. In the **Group Control** window, select the correct **Group** name for the scheduled Sybase backup and click **Start**.

When the status of the selected group in the **Group Control** window changes to **Finished**, the scheduled backup is complete.

An email savegroup completion notification can be configured to provide a report of the scheduled backup. The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* provides information on configuring savegroup completion notifications.

Monitoring scheduled backups

The NetWorker software provides several types of reports about the results of a backup:

- ◆ The NetWorker server's savegroup completion notification
- ◆ A series of error messages written to the NetWorker message log files
[Appendix D, "Troubleshooting and Error Messages,"](#) provides more information about NetWorker and NetWorker XBSA error messages.
- ◆ A scrolling list of messages displayed in the main window of the NetWorker administrative graphical interface.
- ◆ A scrolling list of messages displayed in the Group Control window of the NetWorker administrative graphical interface.
- ◆ A printout of the NetWorker server's bootstrap file for the backup session.

Detailed information about the completion report displays are available in the `/nsr/logs/messages` file.

The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide* provides complete details about the reports generated by the NetWorker software. The *NetWorker Disaster Recovery Guide* provides suggestions about using these reports as a part of the disaster recovery plan.

How to view the results of a backup

To view the results of a NMS backup operation, use one of the following methods:

- ◆ ["Improved reporting of scheduled backups" on page 48](#)
- ◆ ["Log file" on page 49](#)
- ◆ ["Debug file" on page 49](#)
- ◆ ["nsrinfo command" on page 49](#)
- ◆ ["mminfo command" on page 49](#)

Improved reporting of scheduled backups

NMS uses the NetWorker jobs framework feature to start and track NMS sessions. NetWorker binaries such as `save` use the jobs framework to register their sessions with the jobs daemon. However, the jobs framework is not used during ad hoc backups and restores, but only during scheduled backups.

To view the NMS sessions:

1. In NMC, select **Monitoring**.
The **Sessions** tab is now available.
2. Select the **Sessions** tab, which displays one `save` session for each channel that NMS is using, to view the list of sessions.

The NMC displays progress and completion messages that advise why a backup or restore operation cannot proceed, and when a backup or restore is complete.

After the scheduled backup is complete,

1. In NMC, select **Monitoring**.
The list of groups of scheduled backups is displayed in the **Groups** tab.

2. Select the group that contains the NMS scheduled backup. Right-click the group to view the **Group Details** window.

If the backup or restore is complete, the **Group Details** window displays the message 'Completed successfully' in a dialog box. The dialog box contains one entry for each NMS channel used.

All failed backups are listed in the **Failed** dialog box of NMC. Only one entry per save set is listed in the **Failed** dialog box the failed backup of save set.

For example, a user performs a striped backup with the stripe count as three for the save set SYBASE:/NETS1/model. Three backup sessions are spawned by the Sybase Backup Server. If one of the sessions fails, then the whole save set is listed as failed save set in the Failed dialog box in the Group Details window of NMC.

If the jobs framework fails for any reason NMS exits and the error is also recorded in the debug file, if the NSR_DEBUG_FILE environment variable is set. The text of error messages depends on the version of the NetWorker server you are using.

In this release of NMS, the database name and the save set name passed by the administrator are differentiated. For example, if database name is *model*, and the save set name specified by the you is *SYBASE:/INSTANCE/model*, then in the media database and NMC, the save set name is displayed as *SYBASE:/INSTANCE/model.1*. This differentiation in save set names applies to single, multiple, full, incremental, and instance-level type of backups done by NMC. However, this differentiation does not apply to the meta-data save set backup by NMC.

Log file

View the results of a backup in the log file *daemon.raw*, which is available in the logs directory. Use the **nsr_render_log** utility to view *daemon.raw*, which is in binary form.

Debug file

When the backup is run in debug mode, the results of the backup can be viewed in the debug file, *<Binary_name>.<PID>.dbg*, where *Binary_name* is the process binary name and *PID* is the process ID. The debug file is available in the *aplogs* directory.

nsrinfo command

To view the results of manual and scheduled backups, use the **nsrinfo** command to check the NetWorker client file index on the NetWorker server.

For example:

```
nsrinfo -s networker_server -n sybase client_name
```

where:

- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *networker_client* is the hostname of the computer where the database resides.

mminfo command

To view the results of manual and scheduled backups, use the **mminfo** command to check the NetWorker media index on the NetWorker server.

For example:

```
mminfo -s networker_server -avot -c client_name
```

where:

- ◆ *networker_server* is the hostname of the NetWorker server.

- ◆ *networker_client* is the hostname of the computer where the database resides.

The following sources provide complete information about using the **nsrinfo** and **mminfo** commands:

- ◆ The *EMC NetWorker, Release 7.4, Multiplatform Version, Administration Guide*
- ◆ The **nsrinfo** and **mminfo** man pages

Stopping scheduled backups

Stopping a schedule backup while it is running is *not* recommended. Follow these steps to ensure that the data is recoverable.

To stop a scheduled backup while it is running:

1. In NMC, select the backup group to stop, and then click **Stop**.
2. Once the backup stops, perform a full scheduled backup of the group.

Removing failed backups

If a backup fails, it can be removed manually from the NetWorker server's media database.



IMPORTANT

Restoring a failed backup will result in error.

To manually remove a failed backup:

1. If required, use the **mminfo** command on the NetWorker server to determine if the record for the failed backup is in the media database. For example:

```
mminfo -s networker_server -v -c networker_client
```

where:

- *networker_server* is the hostname of the NetWorker server.
- *networker_client* is the hostname of the computer where the database resides.

Note: In a cluster environment, use the virtual hostname that is used for the Sybase server.

2. Use the output of the **mminfo** command to determine if a save set was created for a failed backup and was *not* automatically removed by the server.

To remove the save set:

- a. Note the save set ID (*ssid*).

The *ssid* environment variable is the save set from the output of the **mminfo** command.

- b. Enter the **nsrmm** command to remove the save set from the media database. For example:

```
nsrmm -s networker_server -S ssid -d
```

where:

- *networker_server* is the hostname of the NetWorker server.
- *ssid* is the NetWorker save set ID.

This chapter describes how to configure and run Sybase database restore operations. The NMS restore operations are run from the command line interface.

This chapter includes the following sections:

- ◆ [About restoring data.....](#) 52
- ◆ [Restoring data.....](#) 53

About restoring data

The **nsrsybrc** command can be used to restore Sybase data that was backed up with the **nsrsybsv** command. A restore operation can be performed on the whole Sybase server and on individual databases.

When a recovery request is initiated, the following occurs:

1. Before restoring data, the NMS software performs a check to determine if the instance performing the restore has permission to access objects of the database.

This ensures that all restores are secure and controlled by the settings on the NetWorker server.

2. During the database restore, the **nsrsybrc** command sends **load database** and **load transaction** commands to the Sybase server.

The NetWorker Client resource configured for the Sybase server includes a browse policy and retention policy.

- ◆ A client file index entry is maintained until the time period specified by the browse policy has been exceeded.
- ◆ A media database entry is maintained until the time period specified by the retention policy has been exceeded.



IMPORTANT

When the browse and retention policies for all the save sets on a backup volume have been exceeded, the volume becomes recyclable and eligible for automatic relabeling by the NetWorker software. The data on the volume might *not* be able to be restored.

How to configure a restore operation

To configure a restore operation:

1. Log in using the operating system user account, that was used to launch the Sybase Backup Server.



IMPORTANT

Do *not* use the root user account for the operating system to run the nsrsybrc command.

2. Ensure that the NMS software has been configured to perform manual or scheduled backups.

The following chapters provide detailed configuration:

- [Chapter 2, "Configuring NMS"](#)
- [Chapter 3, "Performing Manual Backups"](#)
- [Chapter 4, "Performing Scheduled Backups"](#)

3. Ensure that the Sybase server and Sybase Backup Server are running.
4. Ensure that the appropriate operating system user accounts have been set. "[Task 10: Select the operating system user account](#)" on page 17 provides details.
5. Ensure that a target database exists to which data will be recovered. This database must be at least as large as the size of the database backup.

Note: To create a new database for recovery, use the **for load** option.

6. Ensure that the target database to which data will be recovered is *not* currently in use. This database is taken offline during the recovery process.
7. From the NMC, open the Client resource and set the Remote Access attribute to the host on which the data is restored. This step is required to perform an imported restore.

Restoring data

This section describes how to restore Sybase data. It includes the following procedures:

- ◆ [“How to restore single or multiple databases” on page 53](#)
- ◆ [“How to perform a point-in-time restore” on page 54](#)
- ◆ [“How to perform a redirected restore” on page 55](#)
- ◆ [“How to perform an imported restore” on page 56](#)
- ◆ [“How to combine a relocated and imported restore” on page 57](#)
- ◆ [“How to restore the Sybase server in a cluster environment” on page 57](#)
- ◆ [“How to perform a multistripe restore” on page 58](#)

How to restore single or multiple databases

The **nsrsybrc** command restores the most recent database backup and rolls transactions forward by recovering the transaction logs. By default, after the restore operation completes, the database is brought back online.



IMPORTANT

Sybase data must be restored using the nsrsybrc command. Do *not* use the NetWorker recover command to recover database backups. The recovered database overwrites any existing tables in the original database.

Restoring a single database

To restore a single database, enter the following command:

```
nsrsybrc -U user_ID -P password -s networker_server
SYBASE:/Sybase_server/database_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *Sybase_server* is the Sybase server name.
- ◆ *database_name* is the name of the database on the Sybase server.

Restoring the Sybase server

To restore each database on the Sybase server, except the master database, enter the following command:

```
nsrsybrc -U user_ID -P password -s networker_server
SYBASE:/Sybase_server
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *Sybase_server* is the Sybase server name.

Restoring multiple databases

To restore multiple databases, enter the following command:

```
nsrsybrc -U user_ID -P password -s networker_server
SYBASE:/Sybase_server/database1_name
SYBASE:/Sybase_server/database2_name
SYBASE:/Sybase_server/database3_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *Sybase_server* is the Sybase server name.
- ◆ *database_name* is the name of a database on the Sybase server.

How to perform a point-in-time restore

The point-in-time feature restores data to a specific time during an incremental backup, without restoring the entire transaction log. The **nsrsybrc** command uses the time supplied in the **-t** option to restore data to a specific point-in-time. It loads the most recent full backup before the designated time, and then applies any transaction log backups made before that time. The **nsrsybrc** command accepts a wide variety of time designations.

The following sources details about the **nsrsybrc** command:

- ◆ The **nsrsybrc** man page
- ◆ [Appendix A, “NMS Commands”](#)

To perform a point-in-time recovery:

1. Enter the following command:

```
nsrsybrc -U user_ID -P password -s networker_server
-t "MM/DD/YY HH:MM:SS" SYBASE:/Sybase_server/database_name
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the hostname of the NetWorker server.
- *MM/DD/YY HH:MM:SS* indicates the month, day, year, hour, minute, and seconds to recover data to.
- *Sybase_server* is the Sybase server name.
- *database_name* is the name of a database on the Sybase server.

Note: Since the NetWorker server and client can have different date and time values, set the `-t` option with a value of the local time on the Sybase server. After the restore operation, the database is brought online.

2. After the recovery operation completes, check the database to ensure that the data has been recovered.
3. Run a database consistency check, as described in [“Performing a consistency check” on page 23](#).
4. Run a full backup of the database, as described in [“Performing full backups in a noncluster environment” on page 24](#).



IMPORTANT

After performing a point-in-time recovery, the Sybase server restarts the database log sequence. Performing an incremental backup before a full backup is performed causes future recovery operations to fail.

How to perform a redirected restore

A redirected restore loads the backup of an old database to a new database.

The following sections describe different ways to perform a redirected restore:

- ◆ [“Same Sybase server but to a different database name” on page 55](#)
- ◆ [“Different Sybase server but to the same database name” on page 55](#)
- ◆ [“Different Sybase server and to a different database name” on page 56](#)

Same Sybase server but to a different database name

To restore data to the same Sybase server, but to a different database name:

1. Ensure that the new database has been created and has the same device allocations as the original database.
2. Enter the following command:

```
nrsybrc -U user_ID -P password -s networker_server
-d SYBASE:/Sybase_server/new_database_name
SYBASE:/Sybase_server/old_database_name
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the hostname of the NetWorker server.
- *Sybase_server* is the Sybase server name.
- *new_database_name* is the name of the new database on the Sybase server.
- *old_database_name* is the name of the old database on the Sybase server.

Different Sybase server but to the same database name

To recover data to a different Sybase server, but to the same database name:

1. Ensure that the new database has been created and has the same device allocations as the original database.
2. Enter the following command:

```
nsrsybrc -U user_ID -P password -s networker_server
-d SYBASE:/new_Sybase_server/database_name
SYBASE:/old_Sybase_server/database_name
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the hostname of the NetWorker server.
- *database_name* is the name of a database on the Sybase server.
- *new_Sybase_server* is the name of the new Sybase server.
- *old_Sybase_server* is the name of the old Sybase server.

Note: The user ID and password are for the new Sybase server.

Different Sybase server and to a different database name

To recover to a different Sybase server and to a different database name:

1. Ensure that the new database has been created and has the same device allocations as the original database.
2. Enter the following command:

```
nsrsybrc -U user_ID -P password -s networker_server
-d SYBASE:/new_Sybase_server/new_database_name
SYBASE:/old_Sybase_server/old_database_name
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the hostname of the NetWorker server.
- *new_Sybase_server* is the name of the new Sybase server.
- *old_Sybase_server* is the name of the old Sybase server.
- *new_database_name* is the name of the new database on the Sybase server.
- *old_database_name* is the name of the old database on the Sybase server.

Note: The user ID and password are for the new Sybase server.

How to perform an imported restore

An imported restore recovers a backup to a Sybase server on another NetWorker client.

To perform an imported restore, use the *-c* option in the command line or set the *NSR_CLIENT* variable to that client. For example:

```
nsrsybrc -U user_ID -P password -s networker_server
-c networker_client SYBASE:/Sybase_server/database_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *networker_client* is the hostname of the computer where the database resides.

- ◆ *Sybase_server* is the name of the Sybase server.
- ◆ *database_name* is the name of a database on the Sybase server.

Note: Although the **-d** option indicates the destination for recovery, it is *not* used in this example because the destination server name and database name are the same as the original NetWorker client.

How to combine a relocated and imported restore

Relocated and imported restores can be combined, to relocate recovered data to a different NetWorker client computer.

The following example recovers a database from a Sybase server to a different Sybase server, which is the computer from which the **nsrsybrc** command is run:

```
nsrsybrc -U user_ID -P password -s networker_server -c networker_client
-d SYBASE:/new_Sybase_server/database_name
SYBASE:/old_Sybase_server/database_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *networker_client* is the hostname of the computer where the database resides.
- ◆ *new_Sybase_server* is the name of the new Sybase server.
- ◆ *old_Sybase_server* is the name of the old Sybase server.
- ◆ *database_name* is the name of a database on the Sybase server.

How to restore the Sybase server in a cluster environment

To restore the Sybase server in a cluster environment, perform an imported recovery from *clus_vir1* to the local computer.

For example:

```
nsrsybrc -U user_id -P password -s networker_server -c clus_vir1
SYBASE:/Sybase_server/database_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *clus_vir1* is the cluster's virtual name.
- ◆ *Sybase_server* is the name of the Sybase server.
- ◆ *database_name* is the name of a database on the Sybase server.

“[How to perform an imported restore](#)” on [page 56](#) provides instruction on how to perform an imported restore.

How to perform a multistripe restore

The NMS software supports the use of multistripe sessions to restore Sybase data. Multistripe restores are one or more streams of data for a database that can be read in parallel from one or more media devices.

With the NMS software, the multistripe restore feature can enhance performance significantly when a large amount of data is backed up and restored using multiple tape drives.

Before performing a multistripe restore operation, ensure that:

- ◆ The NetWorker server has been properly configured using the same settings as the multistripe backup.
- ◆ All of the devices used by multistripe backup are available and mounted.

To perform a multistripe restore of a database, which was backed up using the multistripe backup option, enter the following command:

```
nsrsybrc -U user_ID -P password -s networker_server  
SYBASE:/Sybase_server/database_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the name of the NetWorker server.
- ◆ *Sybase_server* is the Sybase server name.
- ◆ *database_name* is the name of the database on the Sybase server.

Note: The syntax of multistripe restore is same as a normal database restore. If the data is backed up using the multistripe backup option, the multistripe restore is automatically enabled and uses the same session number as the multistripe backup.

This chapter describes how to perform a disaster recovery.

This chapter includes the following sections:

- ◆ About disaster recovery 60
- ◆ Recover the Sybase server after a disk crash..... 60
- ◆ Recover the NetWorker server and Sybase server after a disk crash 60
- ◆ Recover the master database 61
- ◆ Recover user databases..... 62

About disaster recovery

If a disaster recovery plan is in place and the NMS software maintains regular backups of Sybase instances and the transaction logs associated with them, then critical data can be recovered quickly.

The information in this chapter assumes that you are familiar with how to perform a Sybase system database recovery and a NetWorker disaster recovery operation. The following sources provide information:

- ◆ Sybase server documentation
- ◆ *NetWorker Disaster Recovery Guide*

Recover the Sybase server after a disk crash

To recover a primary disk that contains critical Sybase server and NetWorker client binaries:

1. Reinstall the following software, if required:
 - NetWorker client binaries
 - NMS
 - Sybase server

If regular NetWorker backups of the system binaries are performed, NetWorker software can be used to recover them.

2. Use the printout of database device allocations to re-create the databases. The Sybase documentation provides details about what information should be tracked for disaster recovery.
3. Recover the Sybase system databases and Sybase user databases. The Sybase documentation provides details.
4. Use the **nsrsybrc** command to recover the Sybase data. [Chapter 5, "Restoring Data,"](#) provides details.

Recover the NetWorker server and Sybase server after a disk crash

To recover both the NetWorker server's primary disk containing the online indexes (/nsr file system) and the primary disk for the Sybase server:

1. Reinstall the NetWorker server binaries, if required.
2. Find the latest bootstrap printout for the NetWorker server and recover the server's online indexes. The *NetWorker Disaster Recovery Guide* provides more information.
3. Reinstall the NMS software and the Sybase server, if required.
4. Recover the Sybase system databases and Sybase user databases. The Sybase documentation provides more information.
5. Use the **nsrsybrc** command to recover the Sybase data.

Recover the master database

The master database, which controls the operation of the Sybase server and stores information about all user databases and their associated database devices, may be lost or corrupted in the event of disaster. To recover the master database in different scenarios, refer to the Sybase documentation.

This section provides an example of a procedure that can be used to recover the master database on Sybase ASE version 12.5 and later under the following conditions:

- ◆ The master device is completely lost.
- ◆ A valid dump exists.
- ◆ The valid dump has a default sort order.
- ◆ All other devices are undamaged and do *not* require inspection.



IMPORTANT

If the master database is recovered to a different Sybase server, all the device allocations are copied to the new Sybase server.

If the master database is recovered to another Sybase server on the same computer as the original, they both attempt to use the same database files. For instructions on recovering the master database to a different Sybase server, refer to the Sybase documentation.

For Sybase ASE version 12.5 and later, recover the master database if the valid dump uses the server's default sort order:

1. Rebuild the lost master device by using the **dataserver** command.
2. Start the Sybase server in single-user mode. This mode is also called master-recover mode.
3. Ensure that the Sybase server has the correct name for the Sybase Backup Server in the **sysservers** table.
4. Recover the **master** database from the backup:

```
nrsybrc -U user_ID -P password -s networker_server
SYBASE:/Sybase_server/master
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the name of the NetWorker server.
- *Sybase_server* is the name of the Sybase server.

After the master database is loaded, the Sybase server performs postprocessing checks and validations and then shuts down.

5. Restart the Sybase server.
6. If required, recover the model and other databases that were on the master device.
7. Log in as system administrator and inspect the databases on the Sybase server to ensure that all of the databases are present.

Recover user databases

This section provides an example of a procedure to recover user databases after the database device, *not* the log device, fails. The Sybase documentation provides instructions on how to recover user databases.

To recover the database after the database device fails:

1. Perform an incremental backup of each database on the failed device by using the **nsrsybsv** command with **-R** (no_truncate) option:

```
nsrsybsv -U user_ID -P password -s networker_server -l incr -R
SYBASE:/Sybase_server/database_name
```

where:

- *user_ID* is the username for the Sybase user account.
 - *password* is the password for the Sybase user account.
 - *networker_server* is the name of the NetWorker server
 - *Sybase_server* is the name of the Sybase server.
 - *database_name* is the name of a database on the Sybase server.
2. Examine the space usage of each database on the failed device. For example, from the **isql** command line enter the following commands:

```
select segmap, size from sysusages where dbid =
db_id("database_name")
sp_helpdb database_name
```

where *database_name* is the name of the database on the failed device.

3. Once the information for all databases on the failed device has been obtained, drop each database using the **drop database** command.

If the system reports errors because the database is damaged, use the **dropdb** option with the **dbcc dbrepair** command. From the **isql** command line, enter the following command:

```
dbcc dbrepair (database_name, dropdb)
```

where *database_name* is the name of a database on the failed device.

4. Drop the failed device using the **sp_dropdevice** Sybase system procedure.
5. Initialize the new devices using the **disk init** command.
6. Re-create each database, one at a time, by using the **create database** command.
7. Recover each damaged database from the most recent database backup.

For example:

```
nsrsybrc -U user_ID -P password -s networker_server
SYBASE:/Sybase_server/database_name
```

where:

- *user_ID* is the username for the Sybase user account.
- *password* is the password for the Sybase user account.
- *networker_server* is the name of the NetWorker server.
- *Sybase_server* is the name of the Sybase server.
- *database_name* is the name of a database on the Sybase server.

The **nsrsybr** command recovers the last full database backup of the specific database and applies all of the associated transaction log backups in the order that they were created. The database is automatically brought online after the recovery operation.

This appendix provides information about the NMS commands **nsrsybcc**, **nsrsybrc**, and **nsrsybsv** and their syntax.

This appendix includes the following topics:

- ◆ [Syntax for NMS commands](#)..... 66
- ◆ [NMS commands](#)..... 68

Syntax for NMS commands

This section provides information about the conventions that can be used with the NMS commands, and where and how to locate the relevant usernames and passwords:

- ◆ [“Conventions” on page 66](#)
- ◆ [“Sybase usernames and passwords” on page 66](#)

Conventions

The conventions presented in the command line are as follows:

- ◆ Command options *not* enclosed in any brackets must always be present in the command.
- ◆ Command options enclosed in square brackets, [], are optional.
- ◆ For command options enclosed in braces, {}, one of the options must exist with the command.

Sybase usernames and passwords

The procedure for passing Sybase user and password information to the NMS software differs depending on whether:

- ◆ A scheduled backup is run.
- ◆ The following NMS consistency check, backup, and recovery commands are run:
 - **nsrsybcc**
 - **nsrsybsv**
 - **nsrsybrc**

Scheduled backup

For a scheduled backup, the user and password information is automatically retrieved from the NetWorker Client resource. The security level is high since the username and password information is saved in the NetWorker Client resource on the NetWorker server.

Running the consistency check, manual backup, and recovery commands

To pass the Sybase user and password information to the NMS backup, recovery, and consistency check commands, use one of the following methods:

- ◆ [“Use the -U and -P options with the nsrsybcc, nsrsybsv, and nsrsybrc commands” on page 66](#)
- ◆ [“Set the \\$USER and \\$PASSWORD environment variables” on page 67](#)
- ◆ [“Use the -c, -s, -N and -g options with the nsrsybsv command” on page 67](#)
- ◆ [“Use the -c, -s, -N and -g options with the nsrsybcc command” on page 67](#)

Use the -U and -P options with the nsrsybcc, nsrsybsv, and nsrsybrc commands. When running the **nsrsybcc**, **nsrsybsv**, and **nsrsybrc** commands, use the -U and -P options.

The security level is low with this method since the username and password must be explicitly typed in the command line. During runtime, other users might access the username and password information.

For example:

```
nsrsybsv -U user_ID -P password -s networker_server  
SYBASE:/Sybase_server/database_name
```

where:

- ◆ *user_ID* is the username for the Sybase user account.
- ◆ *password* is the password for the Sybase user account.
- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *Sybase_server* is the Sybase server name.
- ◆ *database_name* is the name of the database on the Sybase server.

Set the \$USER and \$PASSWORD environment variables

Before issuing the **nsrsybcc**, **nsrsybsv**, and **nsrsybrc** commands:

1. Set the \$USER and \$PASSWORD environment variables.
2. If the environment variables are set in the user profile, change the file permission to 600. This prevents other users from obtaining the username and password from the user profile.

The security level is medium with this method since the username and password must be explicitly defined in the environment variables.

Use the -c, -s, -N and -g options with the **nsrsybsv** command

Use the -c, -s, -N and -g options with the backup command **nsrsybsv** to query the user and password information from the NetWorker server.

For example:

```
nsrsybsv -c networker_client -s networker_server -N saveset_name -g group  
SYBASE:/Sybase_server/database_name
```

where:

- ◆ *networker_client* is the hostname of the computer where the database resides.
- ◆ *networker_server* is the hostname of the NetWorker server.
- ◆ *saveset_name* is the name of the NetWorker save set.
- ◆ *group* is the name of the NetWorker group.
- ◆ *Sybase_server* is the Sybase server name.
- ◆ *database_name* is the name of the database on the Sybase server.

The security level is high with this method since the username and password information is securely saved in the NetWorker Client resource on the NetWorker server. The **nsrsybsv** command queries the NetWorker server to determine if a NetWorker client matches the client, group and save set information. If found, the **nsrsybsv** command uses the Sybase user and password information defined in the NetWorker Client resource to perform the backup.

Use the -c, -s, -N and -g options with the **nsrsybcc** command

Use the -c, -s, and -g options with the recover command **nsrsybcc** to query the user and password information from the NetWorker server.

For example:

```
nsrsybcc -c networker_client -s networker_server -g group
SYBASE:/Sybase_server/database_name
```

The security level is high since the username and password information is securely saved in the NetWorker Client resource on the NetWorker server. The **nsrsybcc** command queries the NetWorker server to determine if a NetWorker client matches the client, group, save set, and database information. If found, the **nsrsybcc** command uses the Sybase user and password information defined for that NetWorker Client resource to perform a consistency check.

NMS commands

This section lists NMS options associated with the following commands:

- ◆ “**nsrsybcc**” on page 68
- ◆ “**nsrsybrc**” on page 69
- ◆ “**nsrsybsv**” on page 69

nsrsybcc

This section describes the options associated with the **nsrsybcc** command.

```
[-qvh?] [-U user_ID] [-P password] [-c clientname] [-s server]
[-g group] [-o ckal] [-o ckdb] [-o ckdbnoidx] [-o ckcat] [-o ckstor]
{SYBASE:/ASE_servername/database_name |
SYBASE:/ASE_servername/database_name
SYBASE:/ASE_servername/database_name ...}]
```

where:

c	Specify Client hostname.
g	SpecifyBackup group. This option overrides NSR_GROUP.
h	Displays usage.
P	Password to log in to the Sybase server.
q	Quiet mode.
s	Specify NetWorker server to use. If gethostname for the server fails, an error occurs. This option overrides NSR_SERVER.
U	Username to log in to the Sybase server.
v	Verbose mode.
?	Displays usage.

-o ckdb | -o ckdbnoidx
dbcc checkdb (... , skip_ncindex)

-o ckal
dbcc checkalloc

-o ckcat
dbcc checkcatalog

-o ckstor
dbcc checkstorage (The dbccdb database must also have been set up.)

nsrsybrc

This section describes the options associated with the **nsrsybrc** command.

```
[ -hkpqv? ]
[ -r backup-password ] [-V header/full/verifyonly ]
[ -U username ] [ -P password ]
[ -d SYBASE:/ASE-server-name [ /database-name ]
[ -s server ] [ -c client-name ]
[ -t date ]
[ -e aes_pass_phrase ]
{SYBASE:/ASE-server-name | SYBASE:/ASE-server-name/database-name
 [SYBASE:/Ase-server-name/database-name ...]}
```

where:

- c** NetWorker client hostname. Used in imported recoveries.
- d** Destination for recovery. If none is provided, the database is recovered to its original location, overwriting any existing data. If one is provided, the database (or instance) is recovered to another database (or instance).
- e** Used during recovery to specify the additional passphrases. This option can be specified multiple times.
- h** Displays usage of the command.
- k** Perform a database consistency check on each database once it has been restored. The results of the database consistency check are written to stdout.
- p** Do not bring the database online after the recovery has completed.
- P** Password to log in to the Sybase server.
- q** Quiet mode.
- r** Use to set password protection at the time of backup and restore.
- s** Specify the NetWorker server to use. If ghostbyname for the server fails, an error occurs. This overrides NSR_SERVER.
- t** Specify the time for data recovery. For Sybase server 11.5 or later, this option is used as the time for point-in-time recovery.
- U** Username to log in to the Sybase server.
- v** Verbose mode.
- V** Database backup and restore verification.
- ?** Displays usage.

nsrsybsv

This section describes the options associated with the **nsrsybsv** command.

```
[ -CGRTdhpvq? ]
[ -U username ] [ -P password ]
[ -r backup-password ] [-V header/full/verifyonly ]
[ -w browse-time ] [ -y retention-time ]
[ -s server ] [ -S stripe_count ]
[ -c client-name ] [ -N SYBASE:/ASE-server-name [ /database-name ] ]
[ -b pool ] [ -g group ] [ -l level ]
[ -W width ]
[ -X exclude-file ]
SYBASE:/ASE-server-name | SYBASE:/ASE-server-name/database-name ...
```

where:

b	Specifies a particular destination pool for the databases and transaction logs.
c	Specify the client name for starting the save session.
C	Use XBSA compression.
g	Backup group. This overrides NSR_GROUP.
G	Perform a dump with the NO_LOG option.
h	Displays usage.
l	Backup(save) level. Valid options are full and incremental. The default is full.
N	Override the constructed save set name.
p	Do not promote an incremental backup to a full backup if an incremental backup cannot be performed.
P	Password to log in to the Sybase server.
q	Quiet mode.
r	Use to set password protection at the time of backup and restore.
R	Perform a dump without truncating the transaction log as follows: Perform a dump transaction with no_truncate if it is an incremental backup. Perform a dump database without the preceding dump transaction for a full backup.
s	Specify the NetWorker server to use. If gethostbyname for the server fails, an error occurs. This overrides NSR_SERVER.
S	Specify the number of stripes to be used in backing up each of the databases in this set. The default value for the stripe-count is 1.
T	Perform a dump with the truncate_only option. This is valid with a full or an incremental backup.
U	Username to log in to the Sybase server.
v	Verbose mode.
V	Database backup and restore verification.
w	Specify browse time.
W	The width used when formatting summary information output.
X	Specify file for exclusion during backup.
y	Specify retention time.
?	Displays usage.

This appendix describes how to change NetWorker XBSA environment variables and lists their default values and valid options.

This appendix includes the following topics:

- ◆ [About XBSA environment variables](#) 72
- ◆ [XBSA environment variables definitions and values](#) 72

About XBSA environment variables

NetWorker XBSA allows for configuration of environment options to activate certain features of NetWorker software *not* directly supported by X/Open specifications. NetWorker XBSA and the libbms shared library enable the Sybase Backup Server API and the NetWorker software to interact during backup and recover operations.

The NetWorker XBSA environment variables can be modified by customizing the **nsrsyb** script. While most of the environment variables described appear in the default **nsrsyb** script, others are set in the NetWorker XBSA shared libraries that are included with the NMS software.

XBSA environment variables definitions and values

The following NetWorker XBSA environment variables are listed and defined in subsequent sections:

- ◆ “NSR_BACKUP_LEVEL” on page 73
- ◆ “NSR_CLIENT” on page 73
- ◆ “NSR_COMPRESSION” on page 73
- ◆ “NSR_DATA_VOLUME_POOL” on page 73
- ◆ “NSR_DEBUG_FILE” on page 73
- ◆ “NSR_DEBUG_LEVEL” on page 74
- ◆ “NSR_GROUP” on page 74
- ◆ “NSR_LOG_VOLUME_POOL” on page 74
- ◆ “NSR_NO_BUSY_ERRORS” on page 74
- ◆ “NSR_SAVESET_NAME” on page 74
- ◆ “NSR_SERVER” on page 75
- ◆ “NSR_AES_ENCRYPTION” on page 75
- ◆ “NSR_ENCRYPTION_PHRASES” on page 75

NSR_BACKUP_LEVEL

Definition	The NSR_BACKUP_LEVEL environment variable indicates the NetWorker backup level to use for the XBSA session.
Default Value	FULL
Possible Values	Although NetWorker software supports backups of levels full, 1 through 9, incremental, and skip, NMS does <i>not</i> support levels 1 through 9. <ul style="list-style-type: none"> • If a level other than full, incremental, or skip is assigned, the backup fails and displays the message "Only level full or incremental backups allowed". • If the skip level is assigned for a save set, the savegroup operation is completed successfully, but does <i>not</i> perform a backup of the data.

NSR_CLIENT

Definition	The NSR_CLIENT environment variable indicates the NetWorker Client resource to use for the XBSA session.
Default Value	The host from which the XBSA session is initiated, as indicated by getlocalhost() is the default value for NRS_CLIENT.
Possible Values	Because the client name is an arbitrary string, the value for NSR_CLIENT is <i>not</i> checked directly. An incorrect value might cause an authentication or system error in the NetWorker software.

NSR_COMPRESSION

Definition	The NSR_COMPRESSION environment variable indicates whether to compress the backup data as it is sent to the NetWorker server.
Default Value	FALSE
Possible Values	Setting NSR_COMPRESSION to a value of TRUE means that the standard compression technique for XBSA for NetWorker software is performed on the backed up data. Setting NSR_COMPRESSION to a value of FALSE means that compression is <i>not</i> performed.

Note: Compressing data from the Sybase server might accelerate backups, as long as the Sybase server can send data to the backup server fast enough to keep the tape drive streaming. Data compression during backup impacts CPU usage on the backup server, but reduces the amount of data sent to the NetWorker server.

NSR_DATA_VOLUME_POOL

Definition	The NSR_DATA_VOLUME_POOL environment variable indicates the volume pool to which datafiles should be backed up.
Default Value	XBSA does <i>not</i> set a pool by default. If no pool is specified, the NetWorker server selects the pool based on its Pool resource configuration.
Possible Values	Use any valid NetWorker pool name of 1024 characters or less as the NSR_DATA_VOLUME_POOL value. Set this value in the NetWorker Pool resource and explicitly assign it in a shell script.

NSR_DEBUG_FILE

Definition	The NSR_DEBUG_FILE environment variable indicates the full <i>pathname</i> and <i>filename</i> to which NetWorker XBSA messages should be written. Message logs for XBSA are separated from regular NetWorker messages. NetWorker XBSA error messages are indicated by the prefix BSA.
Default Value	/nsr/applogs/xbsa.messages
Possible Values	Any valid pathname and filename is acceptable. If NetWorker software cannot open the file specified, it writes a BSA_RC_INVALID_KEYWORD error message to one of the following locations: <ul style="list-style-type: none"> • The alternate /nsr/applogs messages directory created during installation • The directory assigned to the TMPDIR environment variable • The /tmp directory, if TMPDIR is not set

NSR_DEBUG_LEVEL

Definition	The NSR_DEBUG_LEVEL environment variable sets the level of NetWorker XBSA error report messages sent to the <i>xbsa.messages</i> log file.
Default Value	The default value is 2, which means that critical error messages and all network (RPC) errors are written to <i>xbsa.messages</i> .
Possible Values	Any integer from 0 to 9 is valid. Higher values within the range generate more detailed reports: <ul style="list-style-type: none"> • A value of 0 means that no error messages are written to <i>xbsa.messages</i>. • A value of 1 means that only critical error messages are written to <i>xbsa.messages</i>. • A value of 2 means that all network (RPC) errors are written to <i>xbsa.messages</i>. • A value of 3 means that all NetWorker XBSA informational messages are written to <i>xbsa.messages</i>. The default value in the nsrsybsv , nsrsybrc , and nsrsybcc commands can be overwritten with the -D option.

NSR_GROUP

Definition	The NSR_GROUP environment variable indicates the group configuration to use for a backup session.
Default Value	None
Possible Values	Use any valid NetWorker group name of 1024 characters or fewer as the NSR_GROUP value. Invalid group names might cause authentication or system errors in another routine. A NetWorker group configuration acts as an alarm clock, notifying the NetWorker server that a group of clients has a backup scheduled to occur at the time designated in the group's Start Time attribute.

NSR_LOG_VOLUME_POOL

Definition	The NSR_LOG_VOLUME_POOL environment variable indicates the volume pool to which transaction logs should be backed up.
Default Value	NetWorker XBSA does <i>not</i> set a pool by default. If no pool is specified, the NetWorker server selects the pool based on its Pool resource configuration.
Possible Values	Use any valid NetWorker pool name of 1024 characters or fewer as the value for NSR_LOG_VOLUME_POOL. Set this value in the NetWorker Pool resource.

NSR_NO_BUSY_ERRORS

Definition	The NSR_NO_BUSY_ERRORS environment variable indicates whether the savegroup should wait for a busy NetWorker server or fail immediately.
Default Value	The default value is FALSE, which means the savegroup waits for the NetWorker server to accept the connection.
Possible Values	Setting NSR_NO_BUSY_ERRORS to a value of TRUE causes the backup to fail immediately when the NetWorker server is busy. A network error message describing the reason for the failure is written to the <i>xbsa.messages</i> file. If NSR_DEBUG_LEVEL is set to 1 and the NetWorker server is busy, the backup process stops and the error message "BSA_RC_ABORT_SYSTYEM_ERROR" is written to the <i>xbsa.messages</i> file.

NSR_SAVESET_NAME

Definition	The NSR_SAVESET_NAME environment variable indicates the save set name NetWorker XBSA should use for a save session.
Default Value	NetWorker XBSA uses the format <i>SYBASE:/Sybase_server/database_name</i> , where <i>Sybase_server</i> is the name of the Sybase server instance.
Possible Values	Use any valid NetWorker save set name as the value for NSR_SAVESET_NAME. Only the first 63 characters are meaningful to the NetWorker server's media database. For example: <code>SYBASE : / Sybase_server/ database_name</code>

NSR_SERVER

Definition	The NSR_SERVER environment variable indicates the <i>hostname</i> of the server that NetWorker XBSA should use for a save session.
Default Value	The default value is the most appropriate server, based on the index name and client name for the session. <i>See also</i> <In Link>"NSR_CLIENT".
Possible Values	The server name defined by the NSR_SERVER environment variable is checked by using <code>gethostbyname()</code> . If this routine call fails, the NetWorker XBSA error code "BSA_RC_INVALID_KEYWORD" is returned.

NSR_AES_ENCRYPTION

Definition	AES encryption is enabled by setting the NSR_AES_ENCRYPTION environment variable for scheduled backups.
Default Value	FALSE
Possible Values	Set NSR_AES_ENCRYPTION to TRUE. This variable is set using the NSR parameter in nsrsyb script.

NSR_ENCRYPTION_PHRASES

Definition	During restore through <code>isql</code> utility provided by Sybase, the environment variable NSR_ENCRYPTION_PHRASES is used to specify the pass phrase for decrypting the backed up data.
Default Value	Passphrase string ending with a comma (",").
Possible Values	Specify one or more passphrases with the NSR_ENCRYPTION_PHRASES environment variable. When setting the value of NSR_ENCRYPTION_PHRASES: <ul style="list-style-type: none">• The passphrases string must end with a comma.• Each passphrase in the string must be separated by a comma.• If comma (",") is part of the passphrase, then it must be escaped using forward slash (/). In this case, the comma will lose its meaning as a separator and will be considered as a part of pass phrase.• If forward slash (/) is used as part of passphrase, then the forward slashes (/) must be escaped.

This appendix details the correct syntax for using the **dump** and **load** commands from the Sybase **isql** command line.

This appendix includes the following topics:

- ◆ Syntax for isql commands..... 78
- ◆ Loading and dumping a database 78
- ◆ Loading and dumping a transaction log 79
- ◆ Recovering a database and transaction logs 80



IMPORTANT

To back up and recover NetWorker save sets, use the NMS nsrsybsv and nsrsybrc programs, rather than the Sybase dump and load commands.

Syntax for isql commands

This section provides information about the conventions that can be used with **isql** commands.

The conventions presented in the command line are as follows:

- ◆ Command options *not* enclosed in any brackets must always be present in the command.
- ◆ Command options enclosed in square brackets, [], are optional.
- ◆ For command options enclosed in braces, {}, one of the options must exist with the command.

Loading and dumping a database

This section describes how to dump and load a database from the Sybase **isql** command line. It includes the following procedures:

- ◆ [“How to dump a database” on page 78](#)
- ◆ [“How to load a database” on page 78](#)

How to dump a database

To dump a database from the Sybase **isql** command line, use the following syntax for each database to be dumped:

```
dump database database_name to "bms::"
```

To specify the hostname and server name, or that a notification should be sent to the operator console, use the following syntax:

```
dump database database_name to
"bms:: [[host_name] [. [Sybase_server] [. [database_name] ]]]"
[with notify = {client| operator_console}]
```

How to load a database

To load the most recent database backup from the Sybase **isql** command line, use the following syntax:

```
load database database_name from "bms::"
```

To specify the hostname and server name, and a timestamp; or that a notification should be sent to the operator console, use the following syntax:

```
load database database_name from
"bms:: [[host_name] [. [Sybase_server] [. [database_name]
[. [timestamp] ]]]]"
[with {headeronly,} notify = {client|
operator_console}]
```

Example 1 Loading the master database

To load the master database from a backup performed on March 22, 2007 at 11:52:30 a.m., the syntax would be:

```
load database master from "bms::...2007032211523000"
```


**IMPORTANT**

After loading the database, bring it back online.

Loading and dumping a transaction log

This section describes how to dump and load transaction logs from the **isql** command line.

It includes the following procedures:

- ◆ [“How to dump a transaction log” on page 79](#)
- ◆ [“How to load a transaction log” on page 79](#)
- ◆ [“How to find the timestamp for a save set” on page 79](#)

How to dump a transaction log

To dump a transaction log from the **isql** command line, use the following syntax for each transaction log to be dumped:

```
dump transaction database_name to "bms::"
```

To specify the hostname and server name, or that a notification should be sent to the operator console, use the following syntax:

```
dump transaction database_name to
"bms::[[host_name] [. [Sybase_server] [. [database_name]]]]]"
[with {[truncate_only | no_log | no truncate},]
[notify = {client| operator_console}]]]
```

How to load a transaction log

To load the most recent transaction log backup from the **isql** command line, use the following syntax:

```
load transaction database_name from "bms::"
```

To specify the hostname and server name, or that a notification should be sent to the operator console, use the following syntax:

```
load transaction database_name from
"bms::[[host_name] [. [Sybase_server] [. [database_name]
[. [timestamp]]]]]"
[with {headeronly,} [notify = {client|
operator_console}]]]
```

How to find the timestamp for a save set

**IMPORTANT**

Do not use the Save Set Recover window to recover Sybase data. Use the `nsrsybr` command to recover databases and transaction logs. For details, see [“About restoring data” on page 52](#).

To use a specific timestamp when loading a database or transaction log:

1. Find the timestamp for a save set by using either of the following methods:

- Run the following command to obtain a list of all the Sybase save sets for the NetWorker client.

```
nsrinfo -X all -n sybase client_name
```
 - Use the **Save Set Recover** window in NMC to select the save set to be recovered. The date and time are displayed in the **Instances** window. Enter the **load** command at the **isql** command line.
2. Specify a timestamp in the following format:
- ```
YYYYMMDDhhmms111
```
- where:
- *YYYY* indicates the year.
  - *MM* indicates the month.
  - *DD* indicates the day.
  - *hh* indicates the hour.
  - *mm* indicates the minutes.
  - *ss* indicates the seconds.
  - *111* indicates the milliseconds. The *1* millisecond position is optional; alternatively, *000* can be entered for the milliseconds.

---

**Note:** If you do *not* specify a timestamp, the most recent backup is recovered.

---

## Recovering a database and transaction logs

Use the Sybase **load** command from the **isql** command line to recover a database or a transaction log.

To recover database and transaction logs:

1. Ensure that one of the following XBSA environment variables are set for the Sybase Backup Server:
  - NSR\_SERVER
  - NSR\_CLIENT

---

**Note:** The **load** command uses the XBSA environment variables that are set for the Sybase Backup Server.

---

2. Load a database from the **isql** command line:

```
load database database_name from "bms::"
```

---

**Note:** To load a database or transaction log from the **isql** command line, the timestamp for each database or transaction log might be required. If a timestamp is *not* included, the NetWorker software uses the most recent backup. If there are multiple transaction logs, then it is useful to indicate the timestamp when a transaction log is loaded.

---

If required, find the timestamp for a save set by using either of the following methods:

- Enter the following command to obtain a list of all the Sybase save sets for the NetWorker client:  

```
nsrinfo -X all -n sybase networker_client
```

- Select the save set to be recovered:
  - Use the **Save Set Recover** window in the NMC to select the save set. The date and time appear in the **Instances** window.
  - At the **isql** command line, enter the **load** command.



### **IMPORTANT**

**Use the `nsrsybrc` command to recover databases and transaction logs. Use the **Save Set Recover** window to recover Sybase data. [Chapter 5, "Restoring Data,"](#) provides details.**

3. Apply the transaction logs to the database:

```
load transaction database_name from "bms::"
```

4. Bring the database back online:

```
online database database_name
```



---

This appendix describes error messages that could appear while using the NMS software, and provides suggestions to resolve the problems.

This appendix includes the following topics:

- ◆ [Displaying release information](#) ..... 84
- ◆ [Verifying version information](#) ..... 84
- ◆ [NMS error messages](#) ..... 85
- ◆ [Sybase Backup Server and libbms error messages](#) ..... 92
- ◆ [NetWorker XBSA and libbms error messages](#) ..... 94

## Displaying release information

To display release information for the NMS binaries, enter the following command:

```
strings filename | grep '(#)'
```

where *filename* is replaced by the full path to each of the following commands: **nsrsybcc**, **nsrsybrc**, and **nsrsybsv**.

## Verifying version information

To verify the version number of the NMS binaries, enter the appropriate command for the operating system.

On AIX:

```
lsllpp -L all | grep -i lgtonms
```

On HP-UX:

```
swlist -l product NMS
```

On Solaris:

```
pkginfo -l LGTONms
```

On Linux:

```
rpm -qa | grep -i LGTONms
```

## Diagnostic and error messages

Diagnostic messages specific to the NMS software are recorded in the XBSA log file. [Appendix B, “XBSA Variables,”](#) provides information about environment variables.

Diagnostic messages specific to Sybase software are recorded in following log files:

- ◆ ASE log file
- ◆ Sybase Backup Server log file
- ◆ daemon.raw file
- ◆ Debug file

The Sybase documentation provides detailed information about these log files.

### How to send error and diagnostic messages to different files

To make sure that the NMS error and diagnostic messages are written to different files, set the `NSR_DEBUG_FILE` environment variable in the vendor configuration file.

The `NSR_DEBUG_FILE` variable indicates the full *pathname* and *filename* to which NetWorker XBSA messages should be written. Message logs for XBSA are separated from regular NetWorker messages. The NetWorker XBSA error messages are indicated by the prefix BSA.

### How to control the level of detail reported in messages

To control the level of detail reported, set the `NSR_DEBUG_LEVEL` environment variable in the vendor configuration file.

The `NSR_DEBUG_LEVEL` variable sets the level of NetWorker XBSA error report messages sent to the `xbsa.messages` log file.

## NMS error messages

The NetWorker error messages are displayed in the NetWorker Administrator window. The display lists the messages encountered during the previous 24 hours. The messages are also written to `/nsr/messages/daemon.log`.

The NetWorker error messages appear in the format:

```
day hh:mm:ss daemon_or_program_name: message
```

The NetWorker XBSA and libbms error messages are written to the `/nsr/applogs/xbsa.message` file. The libbms error messages are also reported to the Sybase Backup Server, which prints them to the stdout file and logs them in the Sybase Backup Server error log.

The messages are organized alphabetically by NetWorker command name and program name to make them easier to match to the NetWorker message. The messages are then presented along with the cause and/or corrective action to take.

### nsrsyb command

[Table 10](#) lists the error message for **nsrsyb** command.

Table 10 Error message for nsrsyb

| Error message                                                  | Description                                                                                                                                                                                                                       |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>nsrsybsv</b> returned status of value <b>nsrsyb</b> exiting | An error occurred when the <code>nsrsybsv</code> command was run. Check the <code>nwadmin</code> display or the <code>/nsr/applogs/xbsa.messages</code> file on the NetWorker server to determine which error caused the failure. |

### nsrsybcc command

[Table 11](#) list the error messages for **nsrsybcc** command.

Table 11 Error messages for nsrsybcc command

| Error message                                                                                      | Description                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CS-LIBRARY or CT-LIBRARY error: error_message.<br>Operating system error number(n): error_message. | An error occurred in the Sybase Open Client library layer. The operating system part of the error message appears only if an operating system error occurred. These error messages normally appear when the master database is recovered because this operation shuts down the Sybase server, but they are not normal during other operations. The error message text describes the specific problem. |
| the command line did not specify any databases or instances                                        | The <code>nsrsybsv</code> , <code>nsrsybrc</code> , and <code>nsrsybcc</code> command each operate on a database (or, for <code>nsrsybrc</code> and <code>nsrsybcc</code> , a list of databases). No databases or instances were specified on the command line.                                                                                                                                       |
| the command line may specify the entire instance or a list of individual databases, but not both   | Either the entire instance ( <code>SYBASE: /server_name</code> ) or a list of databases ( <code>SYBASE: /Sybase_server/database_name1 SYBASE: /Sybase_server/database_name2</code> ) at the command line can be specified. An instance name and a list of databases cannot be specified at the same time.                                                                                             |

| Error message                                                                                                                                                      | Description                                                                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The command line specifies more than one Sybase instance. Only a single instance may be supplied with each command line.                                           | Each invocation of the <b>nsrsybsv</b> , <b>nsrsybcc</b> , or <b>nsrsybrc</b> programs can operate on a single Sybase server because the user ID and password supplied are unlikely to be the same over multiple servers. Retry the command and run it once for each Sybase server. |
| the database name database_name has a length greater than the maximum of 32                                                                                        | The database name supplied at the command line was longer than 32 characters.                                                                                                                                                                                                       |
| error from server Sybase_server: Msg number, Level number, State number                                                                                            | The Sybase server returned an error. Check the error message that follows this message to determine the reason for the error.                                                                                                                                                       |
| The instance name was not provided in the command line command_line_value. The command line has the form SYBASE:/instance_name/[database_name].                    | The database to be processed was specified as "SYBASE:", but the instance name was not supplied.                                                                                                                                                                                    |
| invalid check option -o value was supplied                                                                                                                         | The database consistency check option that was supplied is not valid. <a href="#">Appendix A, "NMS Commands"</a> and the <b>nsrsybcc</b> man page provide a list of supported options.                                                                                              |
| no NetWorker server was specified                                                                                                                                  | This message indicates that no NetWorker server was specified or could be found. The NetWorker server to which the command is to be issued can be specified with the <b>-s networker_server</b> option.                                                                             |
| non fatal internal error from server server_name: Msg number, Level number, State number                                                                           | The Sybase server returned a nonfatal error. This error does not stop the operation; examine the message to ensure that the error does not lead to future problems.                                                                                                                 |
| path needs to begin with SYBASE:. The command line has the form SYBASE:/instance_name/[database_name]                                                              | The database name option for the nsrsybcc program did not begin with the characters "SYBASE:" All Sybase server save sets must begin with this name.                                                                                                                                |
| SQL Server server_name version is too old. It must be 11.0 or later, and it is version_number.                                                                     | NMS supported is supported on SQL Server 11.x or later and Adaptive Server Enterprise 11.5 or later.                                                                                                                                                                                |
| Username and password were not found in the client client_name resource in group group_name. Edit the client resource for save set save_set_name to include these. | The NetWorker Client resource for this save set and group did not have the Sybase user ID and password set. This means that the scheduled backup could not log in to the Sybase server.                                                                                             |
| username is required and was not supplied                                                                                                                          | A username must be supplied for Sybase log in. This username can be queried from the Client resource in the NetWorker server, entered on the command line, or obtained from the environment variable, \$USER.                                                                       |

**nsrsybrc command**

**Table 12** lists the error messages for the **nsrsybrc** command.



Table 12 Error messages for nsrsybrc command

| Error                                                                                                                                                                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CS-LIBRARY or CT-LIBRARY error: error_message.<br>Operating system error number(n): error_message.                                                                                           | An error occurred in the Sybase Open Client library layer. The operating system part of the error message is displayed only if an operating system error occurred. These error messages might appear when the master database is recovered because this operation shuts down the Sybase server, but they are <i>not</i> normal during other operations. The error message text describes the specific problem. |
| cannot restore to the destination database database_name because it does not exist in the instance server_name                                                                               | The database to which the <b>nsrsybrc</b> command is recovering does <i>not</i> exist. Create the database and try the <b>nsrsybrc</b> command again.                                                                                                                                                                                                                                                          |
| the command line did not specify a database or an instance to restore                                                                                                                        | The name of the database or Sybase server instance to be recovered must be supplied when using the <b>nsrsybrc</b> command.                                                                                                                                                                                                                                                                                    |
| the command line did not specify any databases or instances                                                                                                                                  | The <b>nsrsybsv</b> , <b>nsrsybrc</b> , and <b>nsrsybcc</b> commands each operate on a database (or, for <b>nsrsybrc</b> and <b>nsrsybcc</b> , a list of databases). No databases or instances were specified from the command line.                                                                                                                                                                           |
| the command line may specify the entire instance or a list of individual databases, but not both                                                                                             | Either the entire instance ( <b>SYBASE: / server_name</b> ) or a list of databases ( <b>SYBASE: / server_name/ database_name1 SYBASE: / server_name/ database_name2</b> ) must be specified at the command line. Both an instance name and a list of databases cannot be specified at the same time.                                                                                                           |
| The command line specifies more than one Sybase instance. Only a single instance may be supplied with each command line.                                                                     | Each invocation of the <b>nsrsybsv</b> , <b>nsrsybcc</b> , or <b>nsrsybrc</b> commands can operate on a single Sybase server because the user ID and password supplied are unlikely to be the same over multiple servers. Retry the command and run it once for each Sybase server.                                                                                                                            |
| the database name database_name has a length greater than the maximum of 32                                                                                                                  | The maximum database name length is 32 characters. This error message indicates that the database name supplied at the command line was longer than 32 characters.                                                                                                                                                                                                                                             |
| error from server server_name: Msg number, Level number, State number                                                                                                                        | The Sybase server returned an error. Check the error message that follows this message to determine the reason for the error.                                                                                                                                                                                                                                                                                  |
| If master is being restored, no others can be restored in the same session. The database must be in master recover mode to recover master, and this precludes restoring any other database.= | A list of databases to recover was specified, and the master database was listed along with others. Recovering the master database shuts down the Sybase server, which makes recovering other databases impossible.                                                                                                                                                                                            |
| if the destination is an instance, the source must be an instance, too                                                                                                                       | The <b>-d destination</b> option was used to specify a server instance, but the item to be recovered is a single database. Retry the command and specify the destination database. For example:<br><b>nsrsybrc -U sa -P xxx -d SYBASE: / destination_server/ destination_database SYBASE: / source_server/ source_database.</b>                                                                                |
| if the source is an instance, the destination must be an instance, too                                                                                                                       | The object to be recovered is an entire Sybase server instance, but the destination specified to recover the instance to is a database name. Retry the command and specify the destination as an instance. For example:<br><b>nsrsybrc -U sa -P xxx -d SYBASE: / destination_server SYBASE: / source_server.</b>                                                                                               |

| Error                                                                                                                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The instance name was not provided in the command line command_line_value. The command line has the form SYBASE:/instance_name[/database_name]. | The database to be processed was specified as "SYBASE:", but the instance name was <i>not</i> supplied.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| internal error. Full backup expected but not found.                                                                                             | This error occurs only when a full backup is found, but is then no longer available before the <b>nsrsybrc</b> command recovers the database. For example, this error occurs when the volume containing the full backup is manually relabeled at the same time the incremental backup that depends on that full backup is being recovered.                                                                                                                                                                                              |
| invalid time specification: time value                                                                                                          | The <b>-t time</b> option supplied with the <b>nsrsybrc</b> command was <i>not</i> valid. This option should be supplied in the <b>nsr_getdate</b> form. The <b>nsr_getdate</b> man page provides more details.                                                                                                                                                                                                                                                                                                                         |
| no backup was found for database database_name                                                                                                  | The <b>nsrsybrc</b> command could <i>not</i> find a backup of the database specified for recovery. Run the <b>nsrinfo</b> command to see if a backup exists, and ensure that the user ID used for the <b>nsrsybrc</b> command matches the object owner that is displayed. Run the Sybase Backup Server and the <b>nsrsybrc</b> and <b>nsrsybsv</b> commands from the same user ID to avoid this problem.                                                                                                                                |
| no NetWorker server was specified                                                                                                               | No NetWorker server was specified or could be found. Specify the NetWorker server to which the command is to be issued with the <b>-s server_name</b> option.                                                                                                                                                                                                                                                                                                                                                                           |
| Non fatal internal error from server server_name: Msg number, Level number, State number                                                        | The Sybase server returned a nonfatal error. This error does <i>not</i> stop the operation; examine the message to ensure that the error does <i>not</i> lead to future problems.                                                                                                                                                                                                                                                                                                                                                       |
| path needs to begin with SYBASE:. The command line has the form SYBASE:/instance_name[/database_name]                                           | The <b>-d destination</b> option or the database name option for the <b>nsrsybrc</b> command did <i>not</i> begin with the characters "SYBASE:". All Sybase server save sets must begin with this name.                                                                                                                                                                                                                                                                                                                                 |
| SQL Server server_name version is too old. It must be 11.0 or later, and it is version_number.                                                  | The NMS software is supported on SQL Server 11.x or later and Adaptive Server Enterprise 11.5 or later.                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Sybase server version version_number does not support the "checkstorage" option. Versions 11.5 and later support it                             | The database consistency check <b>checkstorage</b> option works only with Adaptive Server Enterprise 11.5 and later. SQL Server 11.x does <i>not</i> support this option.                                                                                                                                                                                                                                                                                                                                                               |
| there are no databases to restore in instance server_name                                                                                       | There were no databases found in the directory entry for the Sybase server database.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| there is no backup of the instance for the time supplied                                                                                        | No backup could be found for the Sybase server name supplied. Make sure that the <b>nsrsybrc</b> command is run with the same user ID that was used to run the <b>nsrsybsv</b> command. Otherwise, ensure that the time used is correct. If a time is <i>not</i> entered, the current time is used.                                                                                                                                                                                                                                     |
| there is no full backup of database database_name in instance server_name for the time supplied                                                 | Backups of this database exist, but there was <i>not</i> a full backup available for the time requested. Try an earlier time, or run the <b>nsrinfo</b> command to determine when the last full backup occurred. For example, if the full backup has passed its browse policy, the full backup might be listed in the media database but <i>not</i> in the client index. In this situation, re-create the entry in the client index with the <b>scanner -i</b> command, and then recover the database with the <b>nsrsybrc</b> command. |

| Error                                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unable to close temporary file that has environment variables. Check for disk full or privilege errors in /nsr/tmpdir.                                            | The temporary file used to pass environment variables between <b>nsrsybsv</b> and <b>libbms</b> could <i>not</i> be closed. The permissions might be incorrect, or the disk might have insufficient space to write the file. Redirect the <b>nsrsybsv</b> command to create a temporary directory in a different place by setting the NSR_TEMPDIR variable.                                              |
| unable to create directory /nsr/tmpdir                                                                                                                            | The access privileges for the user running the <b>nsrsybsv</b> command are insufficient to create the /nsr/tmpdir directory. Re-create the directory manually or change the permissions so that this directory can be created by this user. Redirect the <b>nsrsybsv</b> command to create a temporary directory in a different place by setting the NSR_TEMPDIR variable.                               |
| unable to open temporary file to pass environment variables                                                                                                       | The temporary file that is used to pass environment variables between <b>nsrsybsv</b> , <b>nsrsybrc</b> , and <b>libbms</b> could <i>not</i> be opened. Check for file access or disk problems. Redirect the <b>nsrsybsv</b> command to create a temporary directory in a different place by setting the NSR_TEMPDIR variable.                                                                           |
| unable to query backup                                                                                                                                            | There was an error querying the backup from the server. Check the /nsr/applogs/xbsa.messages file for the specific error text.                                                                                                                                                                                                                                                                           |
| unable to write environment variables to the temporary file                                                                                                       | The system could <i>not</i> write to the temporary file used to pass environment variables between <b>nsrsybsv</b> and <b>libbms</b> . Check for file access or disk problems.                                                                                                                                                                                                                           |
| Username and password were not found in the client client_name resource in group group_name. Edit the client resource for saveset save_set_name to include these. | The NetWorker Client resource for this save set and group did <i>not</i> have the Sybase user ID and password set. This means that the scheduled backup could <i>not</i> log in to Sybase server.                                                                                                                                                                                                        |
| username is required and was not supplied                                                                                                                         | Supply a username for Sybase log in. This username can be queried from the Client resource in the NetWorker server, entered from the command line, or obtained from the environment variable, \$USER.                                                                                                                                                                                                    |
| Both the truncate only (-T) and the no truncate (-R) options were specified. Only one may be specified for a given backup.                                        | The <b>-T</b> and <b>-R</b> options, when supplied together, ask for opposite results. Select one or the other option and retry the operation.                                                                                                                                                                                                                                                           |
| cannot find database database_name in instance server_name                                                                                                        | The database to be backed up does <i>not</i> exist in the Sybase server.                                                                                                                                                                                                                                                                                                                                 |
| the command line did not specify any databases or instances                                                                                                       | The <b>nsrsybsv</b> , <b>nsrsybrc</b> , and <b>nsrsybcc</b> command each operate on a database (or, for <b>nsrsybrc</b> and <b>nsrsybcc</b> , a list of databases). No databases or instances were specified on the command line.                                                                                                                                                                        |
| the command line may specify the entire instance or a list of individual databases, but not both                                                                  | Specify either the entire instance ( <b>SYBASE : /server_name</b> ) or a list of databases ( <b>SYBASE : /server_name/database_name1 SYBASE : /server_name/database_name2</b> ) at the command line. An instance name and a list of databases cannot be specified at the same time.                                                                                                                      |
| The command line specifies more than one Sybase instance. Only a single instance may be supplied with each command line.                                          | Each invocation of the <b>nsrsybsv</b> , <b>nsrsybcc</b> , or <b>nsrsybrc</b> command can operate on a single Sybase server because the user ID and password supplied are unlikely to be the same over multiple servers. Retry the command and run it once for each Sybase server.                                                                                                                       |
| CS-LIBRARY or CT-LIBRARY error: error_message.<br>Operating system error number(n): error_message.                                                                | An error occurred in the Sybase Open Client library layer. The operating system part of the error message is displayed only if an operating system error occurred. These error messages appear when the master database is recovered because this operation shuts down the Sybase server, but they are <i>not</i> normal during other operations. The error message text describes the specific problem. |

| Error                                                                                                                                                                                                                                 | Description                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| the database name database_name has a length greater than the maximum of 32                                                                                                                                                           | The maximum database name length is 32 characters. The database name supplied at the command line was longer than 32 characters.                                                                                                                      |
| environment variable NSR_BACKUP_LEVEL has an invalid value of value, defaulting to a full backup                                                                                                                                      | The environment variable NSR_BACKUP_LEVEL specified a level other than full, incremental, or skip.                                                                                                                                                    |
| error from server server_name: Msg number, Level number, State number                                                                                                                                                                 | The Sybase server returned an error. Check the error message that follows this error message to determine the reason for the error.                                                                                                                   |
| the exit status of process process_number could not be determined                                                                                                                                                                     | The PRECMD or POSTCMD that was run did <i>not</i> exit, but the process no longer exists.                                                                                                                                                             |
| a full database backup is required and will be done before the transaction log backup                                                                                                                                                 | The incremental backup failed because a full backup must first be performed. Perform a full backup, then retry the transaction log backup.                                                                                                            |
| The -G option is not supported where the transaction log is on a separate device. This option will be ignored.                                                                                                                        | The -G option is <i>not</i> supported for a full backup of a database when the transaction log is on a separate device.                                                                                                                               |
| The -G option is not valid for an incremental backup where the log is on a separate device. It will be ignored. To truncate the transaction log without logging it, use the same command with a level of full instead of incremental. | The -G option is <i>not</i> supported for incremental backups when the transaction log is on a separate device.                                                                                                                                       |
| The instance name was not provided in the command line command_line_value. The command line has the form SYBASE:/instance_name[/database_name].                                                                                       | The database to be processed was specified as "SYBASE:", but the instance name was <i>not</i> supplied.                                                                                                                                               |
| An invalid backup level was supplied. Valid backup levels are full, incremental, and skip                                                                                                                                             | The backup level supplied to <b>nsrsybsv</b> command is <i>not</i> permitted.                                                                                                                                                                         |
| no command to execute in PRECMD or POSTCMD                                                                                                                                                                                            | The PRECMD or POSTCMD environment variable is set, but it has no value. Either unset the environment variable, or enter a value to run in the environment variable.                                                                                   |
| no NetWorker server was specified                                                                                                                                                                                                     | This message indicates that no NetWorker server was specified or could be found. Specify the NetWorker server to which the command is to be issued with the <b>-s server_name</b> option.                                                             |
| Non fatal internal error from server server_name: Msg number, Level number, State number                                                                                                                                              | The Sybase server returned a nonfatal error. This error does <i>not</i> stop the operation; examine the message to ensure that the error does <i>not</i> lead to future problems.                                                                     |
| only one database or instance may be specified                                                                                                                                                                                        | More than one database or instance was supplied on the command line to the <b>nsrsybsv</b> command. The <b>nsrsybsv</b> command only supports a single instance (SYBASE:/server_name) or database (SYBASE:/server_name/database_name) per invocation. |

| Error                                                                                                                                                                                                              | Description                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| path needs to begin with SYBASE:. The command line has the form SYBASE:/instance_name[/database_name]                                                                                                              | The <b>-N save_set_name</b> option or the database name option for the <b>nsrsybsv</b> command did <i>not</i> begin with the characters "SYBASE:". All Sybase server save sets must begin with this name.                                                                     |
| PRECMD or POSTCMD did not return a result. It needs to return zero on success and nonzero on failure.                                                                                                              | The PRECMD or POSTCMD did <i>not</i> return a status value.                                                                                                                                                                                                                   |
| process process_number running command PRECMD or POSTCMD completed with a result of n                                                                                                                              | The PRECMD or POSTCMD exited with a nonzero result code. Check the PRECMD or POSTCMD exit code for details. Also verify that the settings in the PRECMD or POSTCMD are valid. " <a href="#">Environment variables in the nsrsyb script</a> " on page 41 provides details.     |
| SQL Server server_name version is too old. It must be 11.0 or later, and it is version_number.                                                                                                                     | The NMS software is supported on SQL Server version 11.x or later and Adaptive Server version 11.5 or later.                                                                                                                                                                  |
| Sybase server version version_number does not support the "checkstorage" option. Versions 11.5 and later support it                                                                                                | The database consistency check <b>checkstorage</b> option only works with Adaptive Server version 11.5 and later. SQL Server version 11.x does <i>not</i> support this option.                                                                                                |
| The -T option is not valid for an incremental backup where the log is on a separate device. It will be ignored. To truncate the transaction log, use the same command with a level of full instead of incremental. | The -T option only works for a full backup when the transaction log is on a separate device.                                                                                                                                                                                  |
| Unable to close temporary file that has environment variables. Check for disk full or privilege errors in /nsr/tmpdir.                                                                                             | The temporary file used to pass environment variables between <b>nsrsybsv</b> and <b>libbms</b> could <i>not</i> be closed. The permissions might be incorrect, or the disk might have insufficient space to write the file.                                                  |
| unable to create directory /nsr/tmp                                                                                                                                                                                | The access privileges for the user running the <b>nsrsybsv</b> command are insufficient to create the /nsr/tmp directory. Re-create the directory manually or change the permissions so that this directory can be created by this user.                                      |
| unable to create directory entries                                                                                                                                                                                 | The directory entries could <i>not</i> be created. Check the /nsr/applogs/xbsa.messages file for the specific reason that the entries could <i>not</i> be created.                                                                                                            |
| unable to determine whether database and log are on separate segments                                                                                                                                              | The database to be backed up is <i>not</i> in a state in which it can be queried to determine whether incremental backups are allowed. The error message from the Sybase server that was displayed prior to this message indicates the reason the database cannot be queried. |
| unable to dump database database_name in instance server_name                                                                                                                                                      | The <b>dump</b> database command failed. The error message from the Sybase server that was displayed prior to this message indicates the reason the database was <i>not</i> dumped.                                                                                           |
| unable to dump the transaction log for database database_name in instance server_name                                                                                                                              | The command to dump the transaction log failed. The error message from the Sybase server that was displayed prior to this message indicates the reason the transaction log was <i>not</i> dumped.                                                                             |

| Error                                                                                                                                                              | Description                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| unable to dump the transaction log without truncating it for database database_name                                                                                | The command to dump the transaction log with the no_truncate option failed. The error message from the Sybase server that was displayed prior to this message indicated the reason the transaction log was <i>not</i> truncated. |
| unable to execute the command PRECMD or POSTCMD contents                                                                                                           | The PRECMD or POSTCMD could <i>not</i> be found. Ensure the command exists in one of the directories specified in \$PATH.                                                                                                        |
| unable to open temporary file to pass environment variables                                                                                                        | The temporary file used to pass environment variables between <b>nsrsybsv</b> , <b>nsrsybrc</b> , and <b>libbms</b> could <i>not</i> be opened. Check for file access or disk problems.                                          |
| unable to print savegrp completion message                                                                                                                         | After the backup occurred, NetWorker software could <i>not</i> find the save sets in the media database.                                                                                                                         |
| Unable to print summary. One or more parameters are not set                                                                                                        | The parameters that NetWorker software expected to find for the function that prints the <b>savegrp</b> summary were <i>not</i> supplied.                                                                                        |
| unable to spawn process to issue the PRECMD or POSTCMD command                                                                                                     | The PRECMD or POSTCMD could <i>not</i> be run because a process needed to run them was <i>not</i> available.                                                                                                                     |
| unable to truncate the transaction log for database database_name                                                                                                  | The command to truncate the transaction log failed. The error message from the Sybase server that was displayed prior to this message indicated the reason the transaction log was <i>not</i> truncated.                         |
| unable to truncate the transaction log for database database_name with the no_log option                                                                           | The command to truncate the transaction log failed. The error message from the Sybase server that was displayed prior to this message indicates the reason the transaction log was <i>not</i> truncated.                         |
| unable to write environment variables to the temporary file                                                                                                        | The system could <i>not</i> write to the temporary file that was used to pass environment variables between <b>nsrsybsv</b> and <b>libbms</b> . Check for file access or disk problems.                                          |
| Username and password were not found in the client client_name resource in group group_name. Edit the client resource for save set save_set_name to include these. | The NetWorker Client resource for this save set and group did <i>not</i> have the Sybase user ID and password set. This means that the scheduled backup could <i>not</i> log in to Sybase server.                                |
| username is required and was not supplied                                                                                                                          | Supply a username for Sybase log in. This username can be queried from the Client resource in the NetWorker server, entered from the command line, or obtained from the environment variable, \$USER.                            |

## Sybase Backup Server and libbms error messages

When the Sybase Backup Server encounters an error or condition requiring a warning, it writes a message to the Sybase Backup Server error log.

The default error log location for Sybase server version 11.x and 12.x differs:

- ◆ For Sybase server 11.x: *\$\$SYBASE/install*
- ◆ For Sybase server 12.0: *\$\$SYBASE/\$\$SYBASE\_ASE/install*

If an error with the **libbms** shared library occurs, a libbms message is written to the /nsr/applogs/xbsa.messages file and is reported to the Sybase Backup Server. The

Sybase Backup Server logs the **libbms** error messages in the Sybase Backup Server error log.

**Table 13** lists **libbms** error messages that are logged in the Sybase Backup Server error log. The Sybase documentation provides details on other Sybase Backup Server errors.

**Table 13** Sybase Backup Server and libbms error messages

| Error messages                                                                                                                                                                                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| libbms opened with an unknown mode: internal error                                                                                                                                                              | The <b>libbms</b> shared library was opened with a mode other than read or write.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| there is insufficient memory to continue                                                                                                                                                                        | There is <i>not</i> sufficient memory to complete the operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| The time stamp dddddddd has non digits in it. Timestamps are composed of digits in the form YYYYMMDDhhmmsslll.                                                                                                  | The timestamp supplied for the <b>load</b> command from the <b>isql</b> command line has a timestamp with an incorrect format. The timestamp must have the format <b>YYYYMMDDhhmmsslll</b> .<br>where: <ul style="list-style-type: none"> <li>• <i>YYYY</i> indicates the year.</li> <li>• <i>MM</i> indicates the month.</li> <li>• <i>DD</i> indicates the day.</li> <li>• <i>hh</i> indicates the hour.</li> <li>• <i>mm</i> indicates the minutes.</li> <li>• <i>ss</i> indicates the seconds.</li> <li>• <i>lll</i> indicates the milliseconds. The /millisecond position is optional; alternatively, <b>000</b> can be entered for the milliseconds.</li> </ul> |
| time stamps are not valid for dump command                                                                                                                                                                      | The <b>isql</b> command line specified a timestamp for a <b>dump</b> command. Timestamps are <i>not</i> valid with the <b>dump</b> command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| unable to close and create save set                                                                                                                                                                             | The BSA call to create and close the save set for a database or transaction dump failed. Check the <code>/nsr/applogs/xbsa.messages</code> file for specific details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| unable to close save set                                                                                                                                                                                        | The call to close the save set failed during a load of a database or a transaction log. Check the <code>/nsr/applogs/xbsa.messages</code> file for specific details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| unable to create environment variables                                                                                                                                                                          | The resources required to create the internal environment variable array were <i>not</i> available. This might be due to access problems in the <code>/nsr/tmp</code> directory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Unable to create save set. There is likely a configuration or enabler problem. Set the debug level to at least 2, retry the operation, and check the /nsr/applogs/xbsa.messages file for the underlying reason. | The save set could <i>not</i> be created on the NetWorker server. If the debug level is at least 2 (the default), check the <code>/nsr/applogs/xbsa.messages</code> file for the error text. If the debug level is not set at 2, change the setting to 2 and retry the operation. Check the <code>/nsr/applogs/xbsa.messages</code> file for specific details.                                                                                                                                                                                                                                                                                                        |
| unable to create the save set on the server                                                                                                                                                                     | The call to create the save set on the NetWorker server failed. Check the <code>/nsr/applogs/xbsa.messages</code> file for specific details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| unable to end the current read session                                                                                                                                                                          | During a load database or load transaction log operation, the read session of the data from the NetWorker software could not be closed. Check the <code>/nsr/applogs/xbsa.messages</code> file for specific details.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Table 13 Sybase Backup Server and libbms error messages

| Error messages                                                                                                                                                                                                                                          | Description                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unable to find backup of the (database or transaction log) SYBASE:/server_name/database_name. Check the command line for errors in the instance or database name or use nsrinfo to see which save sets are available.                                   | The item to be loaded could <i>not</i> be found. Use the <b>nsrinfo</b> command to check that the object-owner for the backup is the same as the process that launched the Sybase Backup Server and that backups exist for this database.                                                                                               |
| Unable to find full backup of the database database_name for the time supplied.<br>Unable to find incremental backup of the database database_name for the time supplied.<br>Unable to find backup of the database database_name for the time supplied. | No backup could be found in the NetWorker server. If no time was supplied, the time used is the current time, which means that no backup exists. Use the <b>nsrinfo</b> command to check which backups are available and make sure that the object owner shown there is the same as the user ID that launched the Sybase Backup Server. |
| unable to parse stripe specifier                                                                                                                                                                                                                        | The <b>isql</b> command line had a poorly formatted stripe specifier.                                                                                                                                                                                                                                                                   |
| unable to read the requested number of bytes from the save set                                                                                                                                                                                          | During a load database or load transaction log operation, the save set could <i>not</i> be read. Check the <code>/nsr/applogs/xbsa.messages</code> file for specific details.                                                                                                                                                           |
| unable to send data to save set                                                                                                                                                                                                                         | During a database or transaction log dump, the data could <i>not</i> be written to the save set. Check the <code>/nsr/applogs/xbsa.messages</code> file for specific details.                                                                                                                                                           |
| unknown backup type supplied                                                                                                                                                                                                                            | The backup type supplied from NetWorker server was neither a database or a transaction log.                                                                                                                                                                                                                                             |

## NetWorker XBSA and libbms error messages

During a backup or recovery, NetWorker software attempts to record error messages generated by the XBSA library in the file assigned to the `NSR_DEBUG_FILE` environment variable. If the assigned location is invalid or unreachable, NetWorker software writes the message to one of the following locations:

- ◆ The `/nsr/applogs/xbsa.messages` alternate messages directory created during the installation.
- ◆ The directory assigned to the `NSR_TMPDIR` environment variable.
- ◆ The `/tmp` directory, if `NSR_TMPDIR` is *not* set.

For descriptions of the NetWorker XBSA environment variables and values that can be assigned to them in the **nsrsyb** script, see [Appendix B, “XBSA Variables,”](#).

NetWorker XBSA error messages appear in the format:

```
XBSA-1.0 bms-1. process_id day month date hh:mm:ss year function_name:
BSA_RC_message_code: message
```

The **libbms** error messages are also written to the `/nsr/applogs/xbsa.messages` file as well as reported to the Sybase Backup Server. The Sybase Backup Server prints the messages in the `stdout` file and logs them in the Sybase Backup Server error log.



Table 14 lists the NetWorker XBSA and libbms error messages.

Table 14 NetWorker XBSA and libbms error messages

| Error messages                                                                                                                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BSA_RC_ABORT_ACTIVE_NOT_FOUND<br>No active object matched the name that was specified for a BSAMarkObjectInactive                | No active object matching the given search parameters was found in the NetWorker server that is being used by the NetWorker XBSA session                                                                                                                                                                                                                                                                                                                                                                                                               |
| BSA_RC_ABORT_SYSTEM_ERROR<br>System detected error due to <i>explanation</i> . Operation aborted                                 | A general system error occurred within a NetWorker XBSA function call. This error is returned for all NetWorker errors that do <i>not</i> map cleanly to XBSA errors.                                                                                                                                                                                                                                                                                                                                                                                  |
| BSA_RC_APP_OBJECTOWNER_TOO_LONG<br>The appObjectOwner field contained too many characters ( $n \geq n$ )                         | The appObjectOwner field of an ObjectOwner parameter contains too many characters and might be corrupt.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| BSA_RC_AUTHENTICATION_ERROR<br>There was an authentication failure for ObjectOwner <i>ownername</i>                              | The routine failed to authenticate a BSAObjectOwner with NetWorker server used by the NetWorker XBSA session. The code is returned by the routine BSASetEnvironment to allow for the possibility of changing NetWorker servers during a single session by changing the value of the NSR_SERVER environment option. For more details about available settings, see <a href="#">Appendix B, "XBSA Variables,"</a> . The NetWorker software permits all users to back up data and recover their files without passwords, so this should <i>not</i> occur. |
| BSA_RC_BAD_CALL_SEQUENCE<br>The sequence of API calls is incorrect. Must call item1 before item2                                 | An API call sequence was made that does <i>not</i> conform to the XBSA Data Movement API State Diagram document.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| BSA_RC_BAD_HANDLE<br>The handle used to associate this call with a previous BSAInit() call is invalid because <i>explanation</i> | The value passed into the function for bsaHandle contained a NULL pointer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| BSA_RC_BAD_PARAMETER<br>received parameter parm with value value, which is invalid                                               | An invalid parameter was received.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| BSA_RC_BSA_OBJECTOWNER_TOO_LONG<br>The bsaObjectOwner field contained too many characters ( $n \geq n$ )                         | The appObjectOwner field of an ObjectOwner parameter contains too many characters and might be corrupt.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| BSA_RC_BUFFER_TOO_SMALL<br>Buffer is too small to hold the object entry to be returned. n bytes required for the object entry    | The buffer is too small to hold the object entry to be returned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| BSA_RC_COPYGPNAMETOOLONG<br>The copyGpName field contained too many characters ( $n \geq n$ )                                    | The copyGpName field in one of the supplied structures contained more BSA_MAX_COPYGPNAM characters, and the structure could <i>not</i> be used for the requested operation.                                                                                                                                                                                                                                                                                                                                                                            |

Table 14 NetWorker XBSA and libbms error messages

| Error messages                                                                                                                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BSA_RC_DESCRIPTION_TOO_LONG<br>The description field contained too many characters (n >= n)                                   | The Description field in one of the supplied structures contained more than BSA_MAX_DESC characters, and the structure could <i>not</i> be used for the requested operation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| BSA_RC_INVALID_COPYTYPE<br>the copyType field contained an unrecognized value of n                                            | The copyType field in one of the supplied structures has a value that is <i>not</i> in the NetWorker XBSA libraries implementation of this enumerated type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| BSA_RC_INVALID_DATABLOCK<br>the dataBlock parameter contained inconsistent values: bufferLength: n, bufferPtr: n, numBytes: n | The fields of a supplied DataBlock parameter are <i>not</i> internally consistent. This can occur under one of the following conditions: <ul style="list-style-type: none"> <li>When the bufferLen field is less than the numBytes field while data is being sent.</li> <li>When the bufferLen field is nonzero and the bufferPtr field is NULL.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| BSA_RC_INVALID_KEYWORD<br>an entry in the environment structure is invalid (variable=value)                                   | One of the environment strings passed into the function did <i>not</i> have a valid structure. The value structure of an environment keyword is KEYWORD = VALUE, where KEYWORD is a white space delimited string and VALUE is a white space delimited string followed by a null terminator. This can indicate a number of possible errors: <ul style="list-style-type: none"> <li>The KEYWORD was <i>not</i> in the reserved word list. This error is <i>not</i> returned by the NetWorker XBSA libraries because other environment variables might be passed into the library along with valid keywords.</li> <li>The KEYWORD and VALUE strings were <i>not</i> separated by a '=' character. This type of error is also used to detect environment vectors that are <i>not</i> properly terminated with a (char *)NULL entry, as well as invalid KEYWORD VALUE pair formats.</li> <li>The VALUE string was invalid.</li> <li>The VALUE string could <i>not</i> be validated, as in the case of a hostname string that could <i>not</i> be found by the <code>gethostbyname()</code> function.</li> </ul> |
| BSA_RC_INVALID_OBJECTSTATUS<br>the objectStatus field contained an unrecognized value of n                                    | The objectStatus field in one of the supplied structures has a value that is <i>not</i> in the NetWorker XBSA libraries' implementation of this enumerated type.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| BSA_RC_INVALID_OBJECTTYPE<br>the objectType is invalid (n)                                                                    | One of the object type parameters was either passed in directly or contained in one of the following structures: ObjectDescriptor QueryDescriptor was <i>not</i> in the range of BSAObjectType_ANY to BSAObjectType_DIRECTORY.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| BSA_RC_INVALID_TIME<br>a time field contained an unrecognized value of n                                                      | An invalid time value was received.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| BSA_RC_INVALID_VERSION<br>the version field contained an unrecognized value of n                                              | The version for a parameter passed into the function is <i>not</i> supported by this version of NetWorker XBSA. For routines that receive multiple parameters containing a version field, it does <i>not</i> indicate which parameter is <i>not</i> supported.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| BSA_RC_LGNAME_TOO_LONG<br>The LGName field contained too many characters (n >= n)                                             | An LGName, passed in to the function, contained more than BSA_MAX_LGNAME_SIZE characters and might be corrupt. For routines that require multiple LGName parameters, it does <i>not</i> indicate which token was invalid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| BSA_RC_MATCH_EXISTS<br>object matching the specified predicate already exists                                                 | The object already exists in the NetWorker server being used by the NetWorker XBSA session and that the requested operation cannot be completed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

Table 14 NetWorker XBSA and libbms error messages

| Error messages                                                                                                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BSA_RC_MORE_DATA<br>more data is available. Data can be obtained through BSAGetData() or BSAGetNextQueryObject() | This has two meanings in the XBSA Data Movement API: <ul style="list-style-type: none"> <li>• <i>Object Data Retrieval</i> – There is more data available for an object being read from the NetWorker server than is being used by the NetWorker XBSA session. Use BSAGetData to retrieve the next DataBlock from the NetWorker server (see also <a href="#">BSA_RC_BUFFER_TOO_SMALL</a> and <a href="#">BSA_RC_NO_MORE_DATA</a>). This message is not returned by the BSAGetObjectF function because all data for an object is written to a file descriptor by this function.</li> <li>• <i>Query Result Retrieval</i> – There are more objects matching the requested query descriptor from the NetWorker server than is being used by the NetWorker XBSA session. Use BSAGetNextQueryObject to retrieve the next object descriptor from Backup Services (see also <a href="#">BSA_RC_NO_MORE_DATA</a>).</li> </ul> |
| BSA_RC_NO_MATCH<br>The ResourceType predicate value of D does not match the reference value of L                 | The client index and media database are out of synch. To resynchronize the client index and media database, run the <b>nsrck -X</b> command. Alternatively, wait for NetWorker to run <b>nsrck</b> automatically.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| BSA_RC_NO_MATCH<br>The variable predicate value of value does not match the reference value of variable          | No objects matching the specified QueryDescriptor were found in the NetWorker server that is being used by the NetWorker XBSA session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| BSA_RC_NO_MORE_DATA<br>there is no more data for the current object                                              | This has two meanings in the XBSA Data Movement API: <ul style="list-style-type: none"> <li>• <i>Object Data Retrieval</i> – This is used when all the data for an object being retrieved from a NetWorker server was placed into the given DataBlock parameter for a function call (see also <a href="#">BSA_RC_MORE_DATA</a>).</li> <li>• <i>Query Result Retrieval</i> – This is used when the last (or only) object matching a query is returned to the caller (see also <a href="#">BSA_RC_MORE_DATA</a>).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                            |
| BSA_RC_NULL_APIVERSION<br>an ApiVersion pointer is required                                                      | A pointer to an ApiVersion structure, passed into the function, was NULL and is required as input.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| BSA_RC_NULL_BUFFER<br>an buffer pointer is required                                                              | This is <i>not</i> used by NetWorker XBSA. A NULL buffer when reading an object's data (BSAGetData, BSAGetObject) results in no bytes being read and a BSA_RC_MORE_DATA code being returned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| BSA_RC_NULL_DATABLOCK<br>a data block pointer is required                                                        | The DataBlock pointer parameter for the called function was NULL. The caller is responsible for allocating and passing in the DataBlock structure to the NetWorker XBSA library (see also <a href="#">BSA_RC_NULL_BUFFER</a> and <a href="#">BSA_RC_INVALID_DATABLOCK</a> ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| BSA_RC_NULL_ENVIRONMENT<br>an environment pointer is required                                                    | This is <i>not</i> used by NetWorker XBSA. An environment vector parameter that is NULL is <i>not</i> processed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| BSA_RC_NULL_NEWTOKEN<br>a value must be entered for the new token. The old token has expired                     | The SecurityToken parameter, newToken, was found to be NULL and is required as input. See also <a href="#">BSA_RC_NULL_SECURITYTOKEN</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| BSA_RC_NULL_OBJECTDESCRIP TOR<br>an ObjectDescriptor pointer is required                                         | The SecurityToken parameter, newToken, was found to be NULL and is required as input. See also <a href="#">BSA_RC_NULL_SECURITYTOKEN</a> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| BSA_RC_NULL_OBJECTNAME<br>an object name is required                                                             | The ObjectName parameter passed into the called function was NULL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Table 14 NetWorker XBSA and libbms error messages

| Error messages                                                                                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BSA_RC_NULL_OBJECTOWNER<br>an ObjectOwner pointer is required                                        | A pointer to an object-owner structure was NULL and is required as input.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| BSA_RC_NULL_POINTER<br>a required pointer parameter is NULL                                          | The NetWorker XBSA library does <i>not</i> return this code. Instead, specific codes indicating that a required parameter was NULL are returned:<br>BSA_RC_NULL_APIVERSION<br>BSA_RC_NULL_BUFFER<br>BSA_RC_NULL_COPYGPNAME<br>BSA_RC_NULL_COPYID<br>BSA_RC_NULL_DATABLOCK (BSA_RC_NULL_DATABLKPTR)<br>BSA_RC_NULL_ENVIRONMENT<br>BSA_RC_NULL_LGNAME<br>BSA_RC_NULL_NEWTOKEN<br>BSA_RC_NULL_OBJECTDESCRIPTOR<br>BSA_RC_NULL_OBJECTNAME<br>BSA_RC_NULL_OBJECTOWNER<br>BSA_RC_NULL_OLDTOKEN<br>BSA_RC_NULL_QUERYDESCRIPTOR<br>BSA_RC_NULL_RULEID<br>BSA_RC_NULL_SECURITYTOKEN<br>BSA_RC_NULL_STREAM |
| BSA_RC_NULL_SECURITYTOKEN<br>an SecurityToken pointer is required                                    | A pointer to a SecurityToken parameter is NULL and is required as input. The NetWorker XBSA library uses this internally and should <i>not</i> be seen in normal use. The more specific codes BSA_RC_NULL_NEWTOKEN and BSA_RC_NULL_OLDTOKEN are used, as appropriate.                                                                                                                                                                                                                                                                                                                            |
| BSA_RC_OBJECTINFO_TOO_LONG<br>The objectInfo field contained too many characters (n >= n)            | The ObjectInfo parameter passed into the function, either directly or in one of the following data structures, was found to have more than BSA_MAX_OBGINFO characters: ObjectDescriptor                                                                                                                                                                                                                                                                                                                                                                                                          |
| BSA_RC_OBJECTSPACE_NAME_TOO_LONG<br>The objectSpaceName field contained too many characters (n >= n) | The string objectSpaceName contains more than BSA_MAX_OBJECTSPACE_NAME characters in an ObjectName structure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| BSA_RC_PATHNAME_TOO_LONG<br>The pathName field contained too many characters (n >= n)                | The string pathname contains more than BSA_MAX_PATHNAME characters in an ObjectName structure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| BSA_RC_RESOURCE_TYPE_TOO_LONG<br>The resourceType field contained too many characters (n >= n)       | The string resourceType contains more than BSA_MAX_RESOURCE_TYPE characters and might be corrupt.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

Table 14 NetWorker XBSA and libbms error messages

| Error messages                                                                                  | Description                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BSA_RC_SECURITYTOKEN_TOO_LONG<br>The securityToken field contained too many characters (n >= n) | A SecurityToken, passed in to the function, contained more than BSA_MAX_SECURITYTOKEN characters and might be corrupt. For routines that require multiple tokens, it does <i>not</i> indicate which token was invalid. |
| BSA_RC_SUCCESS<br>the function was successful                                                   | The called function did <i>not</i> fail and is returned by all NetWorker XBSA function calls.                                                                                                                          |
| BSA_RC_TRANSACTION_ABORTED<br>the transaction was aborted                                       | The current transaction was aborted by the BSAEndTxn function call. A transaction can either be aborted by an internal error, or by user request through the Vote parameter to this function.                          |



This glossary contains terms related to disk storage subsystems. Many of these terms are used in this manual.

---

### A

**administrator** The person normally responsible for installing, configuring, and maintaining NetWorker software.

**API** An abbreviation for application programming interface, a standard set of computer library routines designed to accomplish a particular set of tasks.

### B

**backup** The writing of saved data to a volume.

**backup group** See [group](#).

**bootstrap** A save set that is essential for the NetWorker disaster recovery procedures.

**browse policy** A policy that determines how long entries for a regular Sybase backup are retained in the NetWorker client file index.

### C

**client** A computer that accesses the NetWorker server to back up or recover files. Clients may be workstations, computers, or file servers.

**client file index** A database of information maintained by the NetWorker server that tracks every database object, file, or file system backed up. The NetWorker server maintains a single client file index for each client computer.

### D

**daemon** A program that lies dormant waiting for a specified condition to occur.

**device** The backup device (tape drive, optical drive, or autochanger) connected to the NetWorker server; used for backing up and recovering client files.

### E

**enabler codes** A special code provided by EMC that activates the software. The enabler code that unlocks the base features for software purchased is referred to as a base enabler. Enabler codes for additional features or products (for example, autochanger support) are referred to as add-on enablers.

## F

**failover** In a cluster network, the process of relocating a resource to its redundant or backup component, either because of a hardware or software failure or for administrative purposes.

**file index** See [client file index](#).

**file system**

1. A file tree on a specific disk partition or other mount point.
2. The entire set of all files.
3. A method of storing files.

**full backup** A backup level in which all files are backed up, regardless of when they last changed.

## G

**group** A client or group of clients that starts backing up its files at a designated time.

## H

**high-availability system** A system that allows the application services to continue despite a hardware or software failure. Each cluster node has its own IP address. Each cluster node also has private (local) resources or disks that are available only to that machine.

## I

**incremental** A backup level in which only files that have changed since the last backup are backed up.

## L

**license enabler** The enabler code that enables you to run a feature or product.

## M

**manual backup** A backup that a user requests from the client's save program. The user specifies participating files, file systems, and directories. A manual backup does *not* generate a bootstrap save set.

**media** The physical storage medium to which backup data is written. NetWorker software supports tape, magnetic or optical disk, and file systems as backup media. See also [volume](#).

**media database** A database that contains indexed entries about the storage volume location and the life cycle status of all data and volumes managed by the NetWorker server. See also [volume](#).

**multistripe backup and recovery feature** Multistripe backups and recoveries are one or more streams of data that can be extracted, in parallel, from a database, and written in parallel to multiple media devices.

## N

**NetWorker client** See [client](#).



|                  |                                                                                                                                                                                                                                                                                                      |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NetWorker server | See <a href="#">server</a> .                                                                                                                                                                                                                                                                         |
| notification     | A message generated and sent to the NetWorker administrator about important NetWorker events.                                                                                                                                                                                                        |
| <b>N</b>         |                                                                                                                                                                                                                                                                                                      |
| NetWorker client | See <a href="#">client</a> .                                                                                                                                                                                                                                                                         |
| <b>O</b>         |                                                                                                                                                                                                                                                                                                      |
| online indexes   | The databases located on the NetWorker server that contains all the information pertaining to the client backups (client file index) and backup volumes (media database).                                                                                                                            |
| operator         | The person who monitors the server status, loads backup volumes into the server devices, and otherwise runs day-to-day NetWorker tasks.                                                                                                                                                              |
| <b>P</b>         |                                                                                                                                                                                                                                                                                                      |
| pathname         | Instructions for accessing a file. An <i>absolute pathname</i> tells you how to find a file beginning at the root directory and working down the directory tree. A <i>relative pathname</i> tells you how to find the file starting where you are now.                                               |
| physical host    | Any one of the nodes (or machines) that form a cluster.                                                                                                                                                                                                                                              |
| pool             | A feature that enables sorting backup data to selected volumes. A pool contains a collection of backup volumes to which specific data has been backed up.                                                                                                                                            |
| <b>R</b>         |                                                                                                                                                                                                                                                                                                      |
| recover          | The NetWorker command used to browse the server index and to recover files from a backup volume to a client's disk.                                                                                                                                                                                  |
| resource         | A component of the NetWorker software that describes the NetWorker server and its clients. Devices, schedules, clients, groups, and policies are examples of NetWorker resources. Each resource contains a list of attributes that define the parameters to use for the specific NetWorker resource. |
| root             | The UNIX superuser account (with username "root" and user ID). By extension, the privileged system-maintenance login on any operating system.                                                                                                                                                        |
| <b>S</b>         |                                                                                                                                                                                                                                                                                                      |
| save             | The NetWorker command that backs up client files to backup volumes and makes data entries in the online index.                                                                                                                                                                                       |
| save set         | A group of files or a file system from a single client computer backed up onto storage media.                                                                                                                                                                                                        |
| save set ID      | An internal identification number that NetWorker software assigns to a save set.                                                                                                                                                                                                                     |
| scanner          | The NetWorker command used to read a backup volume when the online indexes are <i>not</i> available.                                                                                                                                                                                                 |

**server** The computer on a network running the NetWorker software, containing the online indexes and providing backup and recover services to the clients on a network.

**skip** A backup level in which files are skipped and *not* backed up.

**ssid** See [save set ID](#).

**system administrator** The person normally responsible for installing, configuring, and maintaining NetWorker software.

## V

**volume** A unit of storage media, such as a magnetic tape, an optical disk, or a file. A storage device reads from and writes to volumes, which can be physical units (for example, a labeled tape cartridge) or logical units (for example, optical media can store multiple volumes on a single physical platter).

**volume ID** The internal identification assigned to a backup volume by NetWorker.

**volume name** The name you assign to a backup volume when it is labeled.

**volume pool** See [pool](#).

**A**

Aliases attribute in Client resource 46  
 Archive attribute in Client resource 46  
 attributes for resources  
   Client resource 14  
   Server resource 14

**B**

backup  
   Client resource 14  
   customizing schedules 44  
   levels 5, 6  
   reports 48  
   required Sybase roles 13  
   scheduled defined 5  
   selected databases 46  
 Backup Command attribute in Client resource 15, 45  
 BACKUP\_OPT variable 42  
 Browse Policy attribute in Client resource 15, 45

**C**

client 1  
 Client resource 14  
   attributes 14  
     Aliases 46  
     Archive 46  
     Backup Command 15, 45  
     Browse Policy 15, 45  
     Directives 46  
     Group 15, 45  
     Name 15, 45  
     Password 46  
     Remote Access 15, 46  
     Remote User 46  
     Retention Policy 15, 46  
     Save Set 15, 46  
     Schedule 15, 46  
 cluster  
   basic configuration 18  
   restoring data 57  
   scheduled backup 46  
 command

dump 5, 24  
 mminfo 36, 50  
 nsrinfo 24  
 nsrsybcc 23  
 nsrsybrc 6, 13, 56, 57  
 nsrsybsv 24, 25, 30, 31, 32, 77  
 save 4  
 savegrp 30  
 scanner 2

configuration  
   Client resource 14  
   Device resource 15

**D**

DBCCOPT variable 42  
 debug messages 7  
 Device resource 15  
 Directives attribute in Client resource 46  
 dump command 24, 78, 79

**E**

environment variables  
   NetWorker XBSA  
     NSR\_AES\_ENCRYPTION 75  
     NSR\_BACKUP\_LEVEL 73  
     NSR\_CLIENT 73  
     NSR\_COMPRESSION 73  
     NSR\_DATA\_VOLUME\_POOL 45, 73  
     NSR\_DEBUG\_FILE 73  
     NSR\_DEBUG\_LEVEL 74  
     NSR\_GROUP 74  
     NSR\_LOG\_VOLUME\_POOL 45, 74  
     NSR\_NO\_BUSY\_ERRORS 74  
     NSR\_SAVESET\_NAME 74  
     NSR\_SERVER 75  
 nsrsyb script  
   BACKUP\_OPT 42  
   DBCCOPT 42  
   POSTCMD 42  
   PRECMD 42  
   SYBASE 43  
   USE\_CONSISTENCY\_CHECK 43

- error messages
  - manual backups 84
  - NetWorker file 85
  - NetWorker XBSA 73, 94
  - NetWorker XBSA and libbms 95, 96, 97, 98, 99
  - nsrsybrc 87, 88, 89
  - nsrsybsv 89, 90, 91, 92
  - Sybase Backup Server and libbms 92, 93, 94
- F**
- full backups
  - defined 5
  - load from isql 80
- G**
- Group attribute in Client resource 15, 45
- I**
- incremental backups
  - load from isql 80
  - threshold procedure 34
  - when allowed 6
- isql commands
  - load command 80
  - syntax 78, 79
  - threshold procedure 34
- L**
- libbms
  - how NetWorker uses 4
  - NetWorker XBSA error messages 95, 96, 97, 98, 99
  - Sybase Backup Server error messages 93, 94
- load command
  - from isql 80
  - syntax 78, 79
- M**
- manual backups
  - error messages 84
- master database, recovering 61
- media management
  - storage devices 15
- messages See error messages 83
- mminfo command 36, 50
- multi-stripe session
  - backing up data 32
  - configuring a backup 33
  - restoring data 58
- N**
- Name attribute
  - in Client resource 15, 45
  - in Server resource 14
- NetWorker
  - configuration 2
    - Client resource 14
    - Device resource 15
  - error message file 85
  - featured highlights 3
  - NetWorker XBSA
    - error message file 73, 94
    - error messages 95, 96, 97, 98, 99
  - non-ASCII characters 7
  - non-ASCII databases 7
  - non-ASCII environment 7
  - NSR 75
  - NSR\_BACKUP\_LEVEL 72
  - NSR\_CLIENT 73
  - NSR\_COMPRESSION 73
  - NSR\_DATA\_VOLUME\_POOL 73
  - NSR\_DEBUG\_FILE 73
  - NSR\_DEBUG\_LEVEL 74
  - NSR\_GROUP 74
  - NSR\_LOG\_VOLUME\_POOL 74
  - NSR\_NO\_BUSY\_ERRORS 74
  - nsr\_render\_log utility 8
  - NSR\_SAVESET\_NAME 74
  - NSR\_SERVER 75
  - nsrinfo command 24
  - nsrsyb
    - environment variable settings 43
    - nsrsyb script 40, 41
  - nsrsybcc
    - command syntax 23, 65
    - Sybase roles command nsrsybcc 13
  - nsrsybrc
    - command 6, 56, 57
    - command syntax 65
    - error messages 87, 88, 89
    - functionality overview 6, 52
    - Sybase roles 13
  - nsrsybsv
    - command syntax 24, 25, 30, 31, 32, 65, 77
    - error messages 89, 90, 91, 92
    - Sybase roles 13
- O**
- operational messages 7
- P**
- Parallelism attribute in Server resource 14
- Password attribute in Client resource 46
- password-protected 8
- permissions, Sybase 13
- policy
  - browse 15, 45
  - retention 15, 46
- POSTCMD variable 42
- PRECMD variable 42
- preconfigured settings
  - NetWorker XBSA environment variables
    - NSR\_BACKUP\_LEVEL 72
    - NSR\_CLIENT 73
    - NSR\_COMPRESSION 73
    - NSR\_DATA\_VOLUME\_POOL 73
    - NSR\_DEBUG\_FILE 73

NSR\_DEBUG\_LEVEL 74  
 NSR\_GROUP 74  
 NSR\_LOG\_VOLUME\_POOL 74  
 NSR\_NO\_BUSY\_ERRORS 74  
 NSR\_SAVESET\_NAME 74  
 NSR\_SERVER 75

## R

recoveries, types of  
   combined relocated and imported restore 57  
   imported restore 56  
   multi-stripe session 58  
   redirected restore 55  
   restoring in a cluster 57  
 recovering  
   databases not on the master device 62  
   how nsrsybrc works 6, 52  
   master database 61  
 Remote Access attribute in Client resource 15, 46  
 Remote User attribute in Client resource 46  
 resource, types of  
   Client 14  
   Device 15  
 restore  
   cluster environment 57  
   imported restore 56  
   multi-stripe session 58  
   redirected restore 55  
   relocated and imported combined 57  
 Retention Policy attribute in Client resource 15, 46

## S

save command 4  
 Save Set attribute in Client resource 15, 46  
 save sets  
   finding timestamp 79  
   specifying a database 46  
   specifying entire database server 46  
 savegrp command 30  
 scanner command 2  
 Schedule attribute in Client resource 15, 46  
 schedules, customizing 44  
 scripts  
   nms\_config 12  
   nsrsyb 17, 40  
 Server resource  
   attributes  
     Administrator 14  
     Name 14  
     Parallelism 14  
 storage devices  
   Device resource 15  
 Sybase Backup Server  
   error message file 92  
   error messages 93, 94  
 Sybase variable 43

## T

temporary databases 9

threshold procedure, sample 34  
 timestamp 79

## U

USE\_CONSISTENCY\_CHECK  
   description of 43  
   variable 43

## V

variable  
   BACKUP\_OPT 42  
   DBCCOPT 42  
   NSR\_BACKUP\_LEVEL 72  
   NSR\_CLIENT 73  
   NSR\_COMPRESSION 73  
   NSR\_DATA\_VOLUME\_POOL 73  
   NSR\_DEBUG\_FILE 73  
   NSR\_DEBUG\_LEVEL 74  
   NSR\_GROUP 74  
   NSR\_LOG\_VOLUME\_POOL 74  
   NSR\_NO\_BUSY\_ERRORS 74  
   NSR\_SAVESET\_NAME 74  
   NSR\_SERVER 75  
   POSTCMD 42  
   PRECMD 42  
   USE\_CONSISTENCY\_CHECK 43  
 verification level 9  
 verify-only 9

## X

XBSA environment variables  
   NSR\_BACKUP\_LEVEL 72  
   NSR\_CLIENT 73  
   NSR\_COMPRESSION 73  
   NSR\_DATA\_VOLUME\_POOL 73  
   NSR\_DEBUG\_FILE 73  
   NSR\_DEBUG\_LEVEL 74  
   NSR\_GROUP 74  
   NSR\_LOG\_VOLUME\_POOL 74  
   NSR\_NO\_BUSY\_ERRORS 74  
   NSR\_SAVESET\_NAME 74  
   NSR\_SERVER 75

