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Preface

This guide describes how to manage the eHealth database, including monitoring the health of the database, managing its growth, and performing regular database backups. It also includes database troubleshooting information. This guide supports eHealth Release 6.0 and later.

Audience

This guide is intended for eHealth administrators who are responsible for managing the eHealth database. Before using this guide, you should be familiar with networking and database terminology, and general eHealth concepts.

About This Guide

This section describes the possible reading paths that you should follow, depending on your needs, as well as the changes and enhancements that have been made since the last release of this guide. It also includes the documentation conventions used in this guide.

Reading Path

Prior to reading this guide, you should review the Introduction to eHealth guide.

For detailed information about eHealth commands or environment variables referenced within this guide, refer to the “Administration” section of the eHealth Web Help.

Revision Information

This is the first release of this guide.
Documentation Conventions

Table 1 lists the conventions used in this document.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File or Directory Name</td>
<td>Text that refers to file or directory names.</td>
</tr>
<tr>
<td>code</td>
<td>Text that refers to system, code, or operating system command line examples.</td>
</tr>
<tr>
<td>emphasis</td>
<td>Text that refers to guide titles or text that is emphasized.</td>
</tr>
<tr>
<td>enter</td>
<td>Text that you must type exactly as shown.</td>
</tr>
<tr>
<td>Name</td>
<td>Text that refers to menus, fields in dialog boxes, or keyboard keys.</td>
</tr>
<tr>
<td>New Term</td>
<td>Text that refers to a new term, that is, one that is being introduced.</td>
</tr>
<tr>
<td>Variable</td>
<td>Text that refers to variable values that you substitute.</td>
</tr>
<tr>
<td>&gt;</td>
<td>A sequence of menus or menu options. For example, File &gt; Exit means “Choose Exit from the File menu.”</td>
</tr>
</tbody>
</table>

NOTE | Important information, tips, or other noteworthy details.                  |

CAUTION | Information that helps you avoid data corruption or system failures. |

WARNING | Information that helps you avoid personal physical danger. |

Technical Support

If you have a Support Contract ID and password, you can access our Support Express knowledgebase at the following URL: http://search.support.concord.com.

If you have a software maintenance contract, you can obtain assistance with eHealth. For online technical assistance and a complete list of primary service hours and telephone numbers, contact Technical Support at http://support.concord.com.
eHealth includes an integrated database that stores the wide variety of information collected from your IT infrastructure. This repository allows you to run historical reports for your resources.

Since the eHealth database is fully-integrated, it does not require a dedicated database administrator to operate. However, it is important to manage the health of the eHealth database. You need to ensure that the database software is running smoothly, and that the data is backed up regularly. In addition, you need to manage the growth of the database so that it does not run out of disk space. eHealth offers tools that help to automate database management.

This guide describes how to plan your database, manage its growth, and implement a backup strategy to ensure that your data is safe. It describes the factors that can have the greatest impact on the rate of database growth, and how to use the tools that make database management a simple, routine task. In addition, this guide provides troubleshooting information for common database problems.

**Types of Data in the Database**

When you save the results of a discover process, eHealth creates an entry in the database for each element that the discover process found. After each poll, eHealth saves the data it collected for each discovered element in the database.

The eHealth database contains the following types of data:

- **Element information** – identifies each business resource you want to manage.
- **Statistics data** – performance data for resources such as LAN/WAN interfaces, Frame Relay circuits, routers, switches, systems, remote access elements, ATM elements, and response elements.
- **Conversations data** – performance data for user and application traffic across the network, used by eHealth Traffic Accountant.
- **Live Exceptions data, rules, alarms and calendars** – for real-time detection and reporting of faults, potential outages, and delays.
Understanding the Database

The eHealth database is a sophisticated relational database application based on Oracle®. It supports the industry-standard Structured Query Language (SQL), an English-like programming language used to retrieve information and update a database.

The Oracle database consists of datafiles, which are physical structures that store all of the data in the database. A tablespace consists of one or more of these datafiles. Tablespaces are logical storage units within the database that can have tables, indexes, and other internal structures mapped to it. The eHealth database contains a number of tablespaces over several disks. The initial size of the tablespaces is determined by the number of polled elements and the data rollup schedule used to calculate the size of your eHealth database.

Oracle databases also use redo logs and archive logs. Redo logs store data about transactions that alter database information; they are used to restore transactions after a system crash or other system failure. Archive logs are archived copies of redo logs; they provide the capability to recover to a specific point in time for any tablespace in the database. While the Oracle installation enables archive logs, the eHealth software maintains them.

The terms database and instance are often used interchangeably. The largest area of an Oracle installation is the database. To access an Oracle database, you must first have at least one instance of Oracle assigned to that database. An instance is a collection of programs that manage the disk space and tablespaces. When you install Oracle, you are installing an Oracle instance for the eHealth database.

For detailed information about Oracle, refer to the Oracle documentation.

Important Notes About the Database

Follow these best practices as you use the Oracle database:

- Do not install any Oracle patches on your eHealth system. Oracle patches are often not required for the embedded Oracle database within eHealth. Any patches that are required for the eHealth database will be made available as part of an eHealth service pack release.

  NOTE
  CA provides services and support only for the database version that shipped with eHealth and only if the database software is in the same state in which it was shipped by CA.

- Do not use Oracle tools or other third-party software to back up the eHealth database. You must back up your database using the eHealth save and load utilities, as described in Chapter 4, “Backing Up the eHealth Database.”

  CAUTION
  Never back up database files using third-party software, doing so can corrupt the eHealth database.

- Do not make any performance upgrades to your Oracle database. Even if you have an experienced database administrator onsite, you cannot modify the embedded Oracle database. The embedded Oracle license does not allow such upgrades. If you experience performance issues, contact Technical Support.

  CAUTION
  Technical Support cannot support an eHealth database if you have performed customizations, unless those customizations have been performed by or through CA, through the use of a CA authorized toolkit, or with express written authorization from CA.
Planning Your Database

This chapter describes how to plan your eHealth database before installation to ensure optimal performance.

Using the eHealth Sizing Wizard

The eHealth Sizing Wizard is a Web-based tool that helps you determine the disk space and memory requirements for your eHealth system, including the eHealth database. Use the eHealth Sizing Wizard before you install or upgrade an eHealth release to ensure that your system has adequate resources for the database, and to configure your database layout to optimize performance.

The eHealth Sizing Wizard is available on the eHealth Support Web site at the following location:


Figure 1. eHealth Sizing Wizard
Sizing Your Database

The three most important factors in planning your database are the number of elements you intend to monitor, how many days of as-polled data you intend to retain, and the number of disks on which the database will be saved.

Number of eHealth Elements

The number of polled elements determines the initial size of the tablespaces created in the eHealth database. The initial tablespace sizes are designed to optimize performance.

Consider the following recommendations:

- Use the sizing wizard’s popup calculators to accurately count the number of elements for each element type (Figure 2).
- If you anticipate that the number of elements you monitor will grow quickly, specify the total number of elements that you intend to monitor. This will ensure that eHealth has sufficient disk space available as the database grows.

![Figure 2. Popup Calculator for eHealth Elements of System Type](image)

Number of Disks to Use

In environments without Storage Area Networks (SANs), the eHealth database requires a number of tablespaces over several disks. For optimal performance, you should use as many disks as your budget allows and put each directory on a different device. Consider the following recommendations:

- Several small disks are better than one large disk because data access is much faster.
- For optimal redundancy of critical database files, use at least three disks.
Reviewing Specifications and Choosing a Configuration Strategy

When you complete the sizing wizard questions, it produces a detailed list of system requirements (Figure 3). Review these requirements and choose a disk configuration strategy for your database.

![Image of eHealth Sizing Wizard](image)

**Figure 3. Example of System Specifications for a Small eHealth Configuration**
Creating a Custom Database Layout

An optional feature of the eHealth Sizing Wizard allows you to optimize the eHealth database layout for your target system. This functionality is intended for experienced Oracle database administrators who are planning for a fresh installation.

**NOTE**

You do not have to customize your database layout. By default, the eHealth installation program lays out the database files to optimize performance and ensure data integrity.

Specifying Database File Locations

The sizing wizard Layout screen (Figure 4) allows you to specify database file locations and assess the impact of placing the database files in any of the available locations. Each time you change a location, the Interactive Layout Meter updates so that you can see if the disk space is still adequate.

![Figure 4. Sizing Wizard Layout Screen](image_url)
Using the Layout screen, experiment with different database layout combinations, keeping in mind the recommendations stated in the Maximum non-SANS Disk Configuration section of the sizing wizard System Specifications (Figure 3 on page 11).

Remember that the paths that you specify for the eHealth database files must be different from NH_HOME (the directory in which you install eHealth). For example, if you install eHealth in D:\ehealth, you cannot specify D:\ehealth as a database directory, but you could use D:\database.

**Using the Layout Configuration File**

When you specify locations for the Oracle database files, the sizing wizard creates a layout configuration file (LCF). After you download the LCF, you must use it with the eHealth installation program. For more information, refer to the *Creating the Database Layout Configuration File* focus topic.

**Installing the Oracle Database**

The Oracle database is installed as part of the eHealth installation. No further steps are required. For information on installing eHealth, refer to the Installation Guide for your platform.

The eHealth installation program provides you with the flexibility to create an eHealth database that best fits your organization. You can do the following:

- Use the eHealth database defaults (recommended for most sites) so that eHealth uses proprietary algorithms to determine the best way to set up your eHealth database for maximum performance.
- Create a system sizing file that helps the installation program determine the best way to set up your eHealth database for maximum performance.
- Create a layout configuration file to specify exactly how you want the installation program to configure your eHealth database. Only experienced Oracle database administrators who want to tune the eHealth database to meet the specific needs of their organization should use this option.
Managing the eHealth Database

This chapter describes how to monitor the database to ensure that it is operating efficiently, and how to proactively manage the growth of the eHealth database.

Monitoring the Health of the eHealth Database

To ensure that your eHealth database operates efficiently, you should monitor the database by:

- Installing a system management agent (such as the Unicenter® NSM system agent or eHealth® SystemEDGE agent), to alert you of errors and failures in job log files, and report on eHealth database performance metrics.
- Checking disk space periodically.
- Scanning log files for errors, warnings, and failures.

Monitoring Your eHealth System with SystemEDGE and the Oracle AIM

CA recommends that you use the SystemEDGE agent and eHealth AIM for Oracle to monitor your database. Using SystemEDGE and the Oracle AIM allows you to closely monitor the performance of your eHealth system, ensuring that your database is running efficiently.

After you install and configure SystemEDGE and the Oracle AIM, and discover your eHealth system, you can run eHealth At-a-Glance reports for Oracle application service elements from the eHealth Web interface. These reports include charts on useful Oracle metrics, such as its CPU utilization, disk usage, commits, and rollbacks. If you configure log file monitoring, the SystemEDGE agent can also send traps to alert you when errors and warnings in the eHealth log files match the criteria that you specify, allowing you to resolve issues before problems impact the database performance.

For instructions on installing and configuring the SystemEDGE agent and eHealth AIM for Oracle, refer to the eHealth SystemEDGE User Guide and the “Oracle AIM” section of the eHealth Web Help. For information about using SystemEDGE to monitor eHealth, refer to the eHealth System Management Guide.

**NOTE**

For information on using the Unicenter NSM system agent with eHealth, refer to the Monitoring Unicenter NSM System Agents Using eHealth focus topic.
Checking Disk Space Periodically

Datafiles in the eHealth database automatically grow (autoextend) as needed until they reach 32 GB or until there is not enough free space on the disk. To ensure that you have sufficient disk space for the datafiles and tablespaces of the eHealth database, you should periodically check the database status.

**NOTE**

A *tablespace* is a logical storage unit that can contain datafiles within an Oracle database. A *datafile* is a physical structure that stores the data in the database.

To confirm that the database has sufficient disk space remaining:

1. In the eHealth console, select **Database > Status** to open the Database Status dialog box.

![Database Status Dialog Box](image)

**Figure 5. Database Status Dialog Box**

Table 2 describes the summary information that appears at the top of the Database Status dialog box.
Table 2. Database Summary Information

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database Name</td>
<td>Displays the name of the eHealth database (default is EHEALTH).</td>
</tr>
<tr>
<td>Database Size</td>
<td>Displays the current size of the entire database in kilobytes (K), megabytes (M), or gigabytes (G).</td>
</tr>
<tr>
<td>RDBMS Version</td>
<td>Displays the version number of the database software.</td>
</tr>
<tr>
<td>Tablespace</td>
<td>Displays the name of each tablespace.</td>
</tr>
<tr>
<td>Free Space in Datafile</td>
<td>Displays the amount of free space in each datafile. The datafile will automatically extend when free space runs out.</td>
</tr>
<tr>
<td>Free Space On Device</td>
<td>Displays the amount of unused disk space on the disk containing the tablespace (in megabytes). If you do not have sufficient space, you can move datafiles to a tablespace on another disk. For more information, refer to “Managing the Size of Tablespaces” on page 63.</td>
</tr>
<tr>
<td>Datafile Path</td>
<td>Displays the pathname of the disk that contains this datafile.</td>
</tr>
<tr>
<td>Statistics tab</td>
<td>Displays information about statistics data in the database, including:</td>
</tr>
<tr>
<td></td>
<td>• Total number of statistics elements in the database.</td>
</tr>
<tr>
<td></td>
<td>• Size of the database for statistics data.</td>
</tr>
<tr>
<td>Conversations tab</td>
<td>Displays information about conversations or Traffic Accountant data in the database, including:</td>
</tr>
<tr>
<td></td>
<td>• Total number of probes in poller configuration.</td>
</tr>
<tr>
<td></td>
<td>• Total number of nodes observed by the probes.</td>
</tr>
<tr>
<td></td>
<td>• Size of the database for both as-pol led and rolled-up conversations data.</td>
</tr>
</tbody>
</table>

2. For the first tablespace listed, make sure that the Free Space On Device is greater than 10 MB.

3. In a terminal window or a command window, navigate to the location of the first tablespace.

4. Enter the following command to list the files in the datafile.
   
   \texttt{ls -l}

5. Look for any files approaching 32 GB.

   \textbf{NOTE}\hspace{1cm}
   
   If the tablespace has more than one datafile, repeat steps 4 and 5 for each datafile.

6. If the tablespace has one datafile and the size is almost 32 GB, you should add a datafile to the tablespace as described in “Adding a Datafile” on page 63. (If the tablespace has more than one datafile and the size of all datafiles is nearly 32 GB, you should add another datafile.) However, do not add a datafile if the amount of free space in the datafile is more than 2 GB, as reported in the Database Status dialog box.
   
   If the datafile is less than 32 GB and on a device without room for growth, reclaim disk space as described on page 61. If necessary, move the datafile to a device with room to grow as described on page 64.

   \textbf{NOTE}\hspace{1cm}
   
   You cannot move the SYSTEM, NH_ROLLBACK, and NH_TEMP tablespaces.

7. Repeat Steps 2-6 for each tablespace.

8. Click \textbf{Close} to close the Database Status dialog box.
Scanning Log Files for Errors

By checking your log files daily or weekly, you can resolve problems before they impact eHealth reports and normal operations. All eHealth system logs are saved in the $NH_HOME/log directory with file names that associate the log file with a system job.

**NOTE**

Carefully examine the statistics_rollup job log for errors. Errors with the statistics rollup job can lead to the database growing much faster than expected, causing disk space problems and other database issues.

Using OneClick for eHealth, you can quickly find failed jobs by selecting Job History and then sorting by Status. If you want to look at the related log file, note the job type and failure date and time. Then select the name of the system to view the Status Summary window. In the Log Information area, click eHealth Logs. All log files appear sorted by name.

If you have direct access or can telnet to the eHealth system, you can search multiple logs at once by changing to the $NH_HOME/log directory and entering the following command:

```
grep -i keyword *
```

You can substitute any of the following for **keyword**: “error”, “warning”, and “failed”. If you are searching in report logs, substitute “no data” for **keyword**.
Managing the Growth of the Database

This section describes how to manage the growth of the eHealth database, including:

- Factors that Drive Database Growth.
- Using Scheduled Jobs to Control Database Growth.

Factors that Drive Database Growth

The most important factors that drive database growth vary for the eHealth system types. For standard eHealth systems (as well as Distributed eHealth Systems), the following factors are significant:

- Number of polled elements
- Frequency of statistics data rollup
- Number of analyzed data streams

For Traffic Accountant systems, the following factors are significant:

- Number of unique combinations of conversations data
- Frequency of conversations data rollup

Before you make changes to these factors, resize your database accurately using the eHealth Sizing Wizard.

Standard eHealth Systems

The following sections describe the factors that can impact database space needs on a standard eHealth system. The estimates given below are typical patterns.

Number of Polled Elements. With each poll, eHealth saves performance data for each element. The more elements in your poller configuration, the more disk space the eHealth database requires.

The number of elements you monitor can grow over time as you add more resources. If you double the number of polled statistics elements, the database doubles its disk space requirements. For example, if you originally planned for 10,000 elements in your database, and your system grows to 20,000, your database will grow from 33 GB to 66 GB.

Not all elements consume disk space however. For example, eHealth does not save data for the interface subcomponents of routers. Instead, the data is aggregated to the parent element. When you use the eHealth Sizing Wizard, count the number of elements that consume at least one poller license.

Frequency of Statistics Data Rollup. To minimize the amount of disk space that the database uses for statistics data, eHealth rolls up the five-minute as-polled samples into hourly and daily samples for a specified number of weeks. When data ages beyond the last sample, eHealth removes it from the database.

By default, eHealth keeps the last three days of as-polled (or raw) data. It then rolls up the as-polled data into hourly samples and keeps those for six weeks. It then rolls up hourly samples into daily samples and keeps those samples for 70 weeks.

If you need reports that show granular data for longer than three days, you can increase the time as-polled data is retained by changing the rollup schedule. However, this can substantially increase the size of your database. For example, if you increase the number of days of as-polled data from three days to seven days, you can expect a 25% growth in the size of the database, and increasing it to 30 days will triple the amount of disk space needed.
You can also extend the time you keep daily samples to allow for quarter-over-quarter or year-over-year comparisons. If you increase the daily samples to two years, the database will typically grow by 15%.

If you modify the default rollup schedule, be aware of the following guidelines:

- Before you change the rollup schedule for as-polled data, use the eHealth Sizing Wizard to estimate the disk space needs and compare them with your current disk space.
- You can decrease the default number of daily samples (70 weeks), but you should keep at least 52 weeks for trend and historical analysis of the past 12 months’ performance.
- After making modifications, check the Database Status dialog box in the eHealth console daily for a few days to confirm that the database is growing at the rate you expect.

**Number of Analyzed Data Streams.** A scheduled job called Data Analysis runs daily to speed up scheduled Service Level, Health, and MyHealth reports. Data analysis computes values such as health exceptions, service level ranges, and situation-to-watch trends based on performance thresholds defined in service profiles. For each combination of a scheduled report, service profile, and group, eHealth saves a “stream” of analyzed data in the eHealth database. This data allows the report to run significantly faster than if eHealth performed the analysis during report generation.

Table 3 shows the rates at which disk space increases when you add another scheduled report for the same group of elements using a different service profile. The rate differs based on the number of technology types that you are monitoring with scheduled reports.

<table>
<thead>
<tr>
<th>Number of Technology Types</th>
<th>Additional Disk Space Required Per Additional Scheduled Report Using a Different Service Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 GB</td>
</tr>
<tr>
<td>2</td>
<td>3 GB</td>
</tr>
<tr>
<td>3</td>
<td>4 GB</td>
</tr>
</tbody>
</table>

These estimates hold true for systems monitoring up to three technology types. If you have more than five service profiles and monitor more than five technology types, the additional disk space needed when you add a service profile is significant; use the eHealth Sizing Wizard to plan for the additional disk space.
Traffic Accountant Systems

The following sections describe the factors that can impact database space needs on an eHealth system that is polling conversations elements. The estimates given below are typical patterns. eHealth systems running Traffic Accountant must be dedicated to polling conversations elements.

**Number of Unique Combinations of Conversations Data.** When you use eHealth Traffic Accountant, the eHealth database saves a record of each conversation observed by an RMON2 probe or data source (such as a Cisco NetFlow collector). Depending upon the number of users in your network, how often they send and receive traffic, and the location of the probes (the LAN/WAN segment where the probe resides), you could see a large number of unique node names and conversations.

Table 4 shows estimates of database growth when the rate of conversations increases and/or you increase the number of probes observing the traffic.

Table 4. Disk Space Growth of Conversations Data

<table>
<thead>
<tr>
<th>Rate of Conversations per Minute</th>
<th>1 Probe</th>
<th>2 Probes</th>
<th>3 Probes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>31 GB</td>
<td>33 GB</td>
<td>36 GB</td>
</tr>
<tr>
<td>2,000</td>
<td>33 GB</td>
<td>38 GB</td>
<td>44 GB</td>
</tr>
<tr>
<td>3,000</td>
<td>36 GB</td>
<td>43 GB</td>
<td>51 GB</td>
</tr>
<tr>
<td>4,000</td>
<td>38 GB</td>
<td>48 GB</td>
<td>58 GB</td>
</tr>
<tr>
<td>5,000</td>
<td>41 GB</td>
<td>53 GB</td>
<td>66 GB</td>
</tr>
</tbody>
</table>

**Frequency of Conversations Data Rollups.** To minimize the amount of disk space that the database uses for conversations data, eHealth rolls up conversations data. By default, eHealth keeps three days of as-polled (or raw) data. It rolls up the as-polled data into four-hour samples for four days, and the four-hour samples into daily samples for one week. It also rolls up the daily samples into weekly samples for four weeks. When data ages beyond the last sample, eHealth removes it from the database.

If you need detailed reports for the past week or month, you can increase the time as-polled data is retained by changing the rollup schedule. However, this will increase the size of your database. For example, if you have three probes and they observe 5,000 conversations per minute, increasing the as-polled conversations data from three to seven days requires 1.5 times the disk space (66 GB to 97 GB). Increasing the as-polled data from three to 30 days will cause your disk space needs to quadruple (66 GB to 279 GB).

If you need to perform quarter-over-quarter or year-over-year comparisons of weekly samples, you can increase the number of weekly samples from 50 weeks to 104 weeks. This change has a minor impact on disk space, adding about 1 GB to your existing database.
Using Scheduled Jobs to Control Database Growth

eHealth uses several scheduled jobs to help control database growth. The jobs vary for the eHealth system types. For standard eHealth systems, the following jobs are available:

- Statistics Rollup
- Live Exceptions Baseline
- Live Exceptions History
- Delete Database Archive Logs
- Database Maintenance
- Delete Temporary Tables
- Delete Old Reports

For Traffic Accountant systems, the following jobs are also available:

- Conversations Rollup
- Cleanup Nodes

Statistics Rollup

The statistics rollup scheduled job controls the schedule by which eHealth keeps, aggregates, and deletes the performance data for your elements. By default, eHealth retains as-polled statistics on each element for the previous two days. It then summarizes the as-polled data into hourly samples for the previous several weeks, and into daily samples for the previous several months, as shown in Table 5.

<table>
<thead>
<tr>
<th>Data</th>
<th>Rollups</th>
</tr>
</thead>
<tbody>
<tr>
<td>As-polled statistics data</td>
<td>2 days</td>
</tr>
<tr>
<td>Hourly samples of statistics data</td>
<td>6 weeks</td>
</tr>
<tr>
<td>Daily samples of statistics data</td>
<td>70 weeks</td>
</tr>
</tbody>
</table>

By default, the statistics rollup job runs each night at 8 P.M. This is typically a low-usage time for the eHealth system. However, if users in your environment are running ad-hoc reports or scheduled reports during this time, you should change the job to run at a less busy time of the day.

As a best practice, the statistics rollup job should run after the scheduled reports for that day have completed. This ensures that the reports use the latest raw data. Many users schedule reports to run in the early morning hours so it is best to run the rollup job in the evening of that day. If you have to run the rollup job before your daily reports, you should increase the number of as-polled days from two to three. By keeping an extra day of as-polled data, reports such as Health reports can rank elements for the day prior to a daily report for yesterday.

Never disable the statistics rollup job unless directed to do so by Technical Support. If you disable this job, the database will quickly consume the available disk space. If you must disable this job temporarily for any reason, reenable it as soon as possible.
Determining How Much Data to Save. Typically, you should save at least one year (52 weeks) of daily samples for trend and historical analysis. Daily samples do not consume much disk space. For example, one year of rolled-up daily samples uses as much disk space as a day and a half of as-polled data at a five-minute polling interval.

**NOTE**

If you increase the number of days of as-polled data, you may need to create a new database or add more disk space to ensure that the database does not outgrow the partition on which it resides.

Changing the Statistics Rollup Schedule. You can modify the statistics rollup job using either the eHealth console or the nhSchedule command.

To change the statistics rollup schedule:

1. Select **Setup > Schedule Jobs** on the console. The Schedule Jobs dialog box appears.

![Schedule Jobs Dialog Box](image)

2. Select **Statistics Rollup** from the list of jobs under the Application column.

3. Click **Modify**. The Modify Scheduled Statistics Rollup dialog box appears.
4. Modify the statistics rollup schedule as needed:
   - Change the time of day at which the rollup occurs by specifying or selecting a time from the Daily At list.
   - Specify the length of time to retain as-polled data by specifying a number in the As Polled field. Select days or weeks from the adjacent list. The default and recommended value is two days.
   - Specify the length of time to retain hourly samples by selecting 1 Hour Samples and specifying a number in the adjacent field. Select days or weeks from the adjacent list. You might want to use your standard reporting baseline period, which is six weeks, by default.
   - Specify the length of time to retain daily samples by selecting 1 Day Samples and specifying a number in the adjacent field. Select days or weeks from the adjacent list.

5. Click OK. The Modify Scheduled Statistics Rollup dialog box closes.
**Live Exceptions Baseline**

If you use Live Health and have configured it to monitor elements using Deviation From Normal, Time Over Threshold, or Time Over Dynamic Threshold rules, eHealth uses historical data to calculate a baseline for comparison. A baseline is the typical behavior of an element (or group or group list) based on the past several weeks.

By default, the Live Exceptions baseline job runs at 7:00 P.M., and retains the data for six weeks. Each new day, Live Exceptions deletes the oldest day of data. This schedule allows Live Exceptions to retain enough information about historical performance without consuming an ever-increasing amount of disk space.

You can schedule the Live Exceptions baseline job to run at any time of the day but make sure that you choose a time that allows it to complete before midnight. This ensures that Live Exceptions calculates alarms using the most current baseline.

You should not disable the Live Exceptions baseline job because it immediately affects Time Over Dynamic Threshold alarms. If the job is disabled for a week or longer, it also impacts Deviation From Normal alarm comparisons.

You can increase the number of weeks of Live Exceptions data to include in the baseline period. For example, if your IT environment experiences quarterly trends, you can include 13 weeks of Live Exceptions data in the baseline. This increase has a minimal impact on disk space.

**Live Exceptions History**

If you use Live Health, you can view historical alarms in the Live Exceptions Browser. By default, the Live Exceptions History job runs each day at 6:00 P.M and deletes alarm data that is more than two days old.

You can change the job setting to keep alarm data from 1 to 7 days. (eHealth cannot keep alarm data that is more than eight days old.) Also, you can schedule the Live Exceptions history job to run any time of day; running it at different times has no impact on eHealth reports or other jobs. Typically, you should not disable the Live Exceptions history job. You can modify the history job using either the eHealth console (Setup > Schedule Jobs) or the nhSchedule command.

**Delete Database Archive Logs**

Archive logs are backup copies of filled redo logs that provide the capability to recover to a specific point in time for any tablespace in the database. Archive logs consume disk resources; they can also cause the database to freeze if the disk that the archive logs reside on is filled. To prevent this from occurring, archive logs are regularly deleted from the system.

If you are using a full backup strategy (see “Types of Database Saves” on page 30) the Delete Database Archive Logs job deletes archive logs on an hourly basis. You cannot modify or disable this job.

The Delete Database Archive Log job saves information about the job in the following file:

```
/ehealth/log/Delete_Database_Archive_Logs.jobId.log
```
Database Maintenance

The Database Maintenance job performs several maintenance operations on tablespaces and indexes to ensure that the database can use existing space effectively. This scheduled job runs every Sunday at 10:30 A.M. Do not disable this job or your database could grow more quickly than expected.


Delete Temporary Tables

The Delete Temporary Tables job looks for temporary tables that are more than four hours old and deletes them if they are no longer in use. This job runs every four hours automatically. Do not disable this job because your database disks could fill up if a process creates a large temporary table and exits abnormally.

Delete Old Reports

To maintain disk space in the eHealth home directory, eHealth automatically runs the Delete Old Reports job at 6:00 A.M. daily. This job deletes temporary files that are more than four days old and saved reports more than 31 days old.

To modify the Delete Old Reports scheduled job:

2. Select Delete Old Reports from the list of jobs under the Application column.
3. Click Modify. The Modify Scheduled Delete Old Reports dialog box appears.

![Modify Scheduled Delete Old Reports Dialog Box](image-url)
4. Specify the number of days to retain files:
   a. Modify the number of days to retain ASCII, EPS, PDF, or Postscript files, by specifying a value for Keep saved reports for.
   b. Modify the number of days to retain daily, weekly, or monthly Health reports for the Web by specifying a value in the Keep Daily Health Web files for, Keep Weekly Health Web files for, or Keep Monthly Health Web files for field, respectively.
   c. Modify the number of days to retain daily, weekly, or monthly Service Level reports for the Web by specifying a value in the Keep Daily Service Web files for, Keep Weekly Service Web files for, or Keep Monthly Service Web files for field, respectively.
   d. Modify the number of days to retain Trend and What-if reports for the Web by specifying a value for Keep Trend and What-if Web files for.
   e. Modify the number of days to retain At-a-Glance reports for the Web by specifying a value for Keep Glance Web files for.
   f. Modify the number of days to retain Traffic Accountant reports for the Web by specifying a value for Keep Traffic Web files for.
   g. Modify the number of days to retain Top N reports for the Web by specifying a value for Keep Top N Web files for.
   h. Modify the number of days to retain temporary files by specifying a value for Keep temporary files for.

5. Specify a daily or monthly schedule under Schedule:
   • Delete reports on a daily schedule by selecting on these days and one or more days on which to run the Delete Old Reports job.
   • Delete reports on a monthly schedule by selecting on this day of the month and specifying a number from 1 to 31 in the field.

6. Specify the time when the job should run by selecting a time from the at list, or specify a time.

7. Click OK in the Modify Scheduled Delete Old Reports dialog box; then click OK in the Schedule Jobs dialog box.

**Scheduled Jobs for Traffic Accountant Systems**

Traffic Accountant allows you to discover and poll probes, and to generate three types of Traffic Accountant reports to analyze data that is sent between nodes in your IT infrastructure. There are two scheduled jobs that control the size of the Traffic Accountant database:

- Conversations Rollup
- Cleanup Nodes

**Conversations Rollup.** The conversations rollup scheduled job controls how eHealth keeps, aggregates, and deletes the performance data for your Traffic Accountant (TA) elements. By default, it runs each night at 12:05 P.M. and repeats every four hours during the day.

eHealth rolls up two sets of conversations data: all conversations and top conversations.

- All conversations data is every conversation reported by every probe element. The database might have several entries for a conversation if more than one probe reported it.
- Top conversations data is a single entry for every conversation, based on what eHealth calculates as the best data for that conversation.
eHealth maintains a separate rollup schedule for each set of conversations data. In general, you may want to retain more of the top conversations data when your reports focus on the overall conversations that occurred within the network. You may want to retain more of the all conversations data when your reports focus on the traffic observed by each probe.

As discussed in “Frequency of Conversations Data Rollups” on page 21, use caution when specifying the number of days and weeks to keep data, particularly as-polled data. Also be aware of the following guidelines:

- You can decrease the default number of daily samples (70 weeks), but you should keep at least 52 weeks for trend and historical analysis of the past years’ performance.
- Never disable the conversations rollup job unless directed to do so by Technical Support. Your database will quickly consume available disk space if you turn off the job.

For instructions on modifying the conversations rollup schedule, refer to the *Traffic Accountant Administration Guide*.

**Cleanup Nodes.** To conserve disk space in the database, eHealth can hide or delete records for nodes or autonomous systems that have not been referenced for a specified time period. (An autonomous system is a collection of networks under a common administration that share a routing strategy.) When records for nodes or autonomous systems are hidden, you can run reports on their data. However, eHealth removes records of hidden nodes or autonomous systems once it rolls data out of the database. If a probe observes traffic for nodes or autonomous systems with records that have been hidden, the nodes or autonomous systems then reappear in subject lists so that you can run reports on them.

eHealth can also permanently remove records of nodes or autonomous systems when they have not been observed for a specified time period. This setting is useful when you suspect that those nodes or autonomous systems were transient and are not likely to be observed again, and you do not plan to run reports for that data.

**Scheduled Job for Distributed eHealth Systems**

If you have a Distributed eHealth System, it runs the File Staging Area (FSA) Scrubber job every four hours to remove temporary files in the FSA and soft-deleted objects that still have entries in the database. An object can be a group, service profile, or group list. You should not modify this job.

For more information on the Distributed eHealth scheduled system jobs, refer to the *Distributed eHealth Administration Guide*. 
This chapter describes how to backup the eHealth database and restore the data from a backup. It contains the following sections:

- Understanding Database Saves
- Performing a Full Database Save
- Implementing a Database Backup Strategy
- Recovering the Database from a Backup
- Moving the Database

**CAUTION**

Never use third-party software or the Oracle backup tools to back up the eHealth database. Backing up database files using third-party software may corrupt the database by interfering with the internal locking mechanisms used by Oracle. If you use third-party backup software, ensure that you exclude the database files.

To back up the eHealth database, use the database save procedures described in this chapter. Once the database save has finished, you can back up the archive using your third-party backup software.
Understanding Database Saves

This section provides an overview of eHealth database saves. It describes:

- Types of Database Saves
- How Database Saves Work
- Disk Space Requirements
- Tips for All Types of Database Saves

Types of Database Saves

You can backup your database using one of the following methods:

- **Standard (Binary) Save** – A standard save is a full database backup saved as binary data. Standard saves can be loaded onto any eHealth system of the same platform type. To protect your eHealth data, you should schedule a standard save to occur **daily** to backup your database. You also perform a standard save when you want an immediate (non-scheduled) backup of your system, such as before installing an eHealth upgrade, or when you want to move the database to a new eHealth system.

- **Universal (ASCII) Save** – A universal save is a full database backup that is platform-independent, path-independent, and language-independent. Universal saves are smaller and more flexible than binary saves, but take longer to restore than binary saves. Perform a Universal Save when you want to move the database to an eHealth system of a **different** platform type.

**Note**

You must back up your eHealth database using one of these methods. Do **not** use Oracle backup tools or backup tools provided by another vendor.

Standard (Binary) Saves

The standard eHealth database save utility performs a full binary save using Oracle’s Recovery Manager (RMAN). The full database save is platform-dependent, path-dependent, and language-dependent:

- **Platform-dependent** – Full database saves are platform-dependent, but not system-dependent. That is, you cannot save a database on a Windows system and then load it onto a Solaris system, but you can load a database saved on one Solaris system to another Solaris system.

- **Path-dependent** – eHealth remembers the path to which a save was performed. When you attempt to load the files, eHealth attempts to find the files to load **only** in the directory in which they were saved.

- **Language-dependent** – You can load an English database onto an English system only, and you can load a Japanese database onto a Japanese system only.

Universal (ASCII) Saves

A universal save (also called an ASCII save) is a full database save that can be loaded onto an eHealth system of any platform type. For example, using a universal save you can save an eHealth database on a UNIX system and then load it into an eHealth database that is running on a Windows system.

The universal save writes data in an Oracle-proprietary, **platform-independent**, binary format. To load your database into an eHealth database that is running on a different platform, you **must** use this option when you save the database. Universal saves are also **path-independent**, which means that you can save them to any directory and load them to a different directory on the same system or another system.
The universal save is also *language-independent*, which means that you can load an English database onto a French, Spanish, or Japanese system, a French or Spanish database onto an English system, and so on. You *cannot*, however, load a Japanese database onto an English, French, or Spanish system because those systems do not support double-byte characters.

Although universal saves are smaller and more flexible than binary saves, they take much longer to restore than binary saves.

**NOTE**

Universal saves can also be loaded into a system that has a *different* Oracle SID and a different eHealth user from the one in which you saved the database.

### How Database Saves Work

eHealth database saves take place while the eHealth server is online. eHealth continues to poll elements and process scheduled jobs while the database save runs. When you save your eHealth database, you and your users experience no data loss or downtime. However, to minimize performance impacts to other scheduled jobs or ad-hoc reports, you should schedule backups to run and finish during the least busy period of time.

Because the database remains online during backups, any changes to the database that occur while the save is in progress are collected in *archive logs*. When you load a saved database, the nhLoadDb utility makes the database files consistent by applying the archive logs.

**NOTE**

Archive logs are not used when loading a universal (ASCII) save.

### What is Saved

When you perform a standard or universal save, eHealth essentially unloads the entire database and saves it to a set of files, similar to a data-export. eHealth saves all of the tables in the system, one at a time, and copies the data from each table to this set of binary or ASCII files. It then compresses these files into an archive and stores them in the destination directory.

Along with the database, eHealth also saves the following report and configuration files:

- Object model extension (.omx) files
- Report (.rpt, .dac, .rds, .rde, .sds, .sde, .vpns, and .mhd) files
- Report presentation variable (.vars) files
- Database data information (.ddi) files
- Database layout configuration (.lcf) files
- Time zone information
- Traffic Accountant view definitions
Disk Space Requirements

When choosing locations for your backups, ensure that they combine to provide adequate disk space. Table 6 provides estimates of the size of a standard save based on the number of polled elements and the number of days of as-polled data.

When you schedule saves (or if you perform a standard save to the same location as an existing save), each existing save is retained until the new save completes and is validated. Therefore, you must have adequate disk space for at least two full saves. For example, if you poll 10,000 elements and save 30 days of as-polled data, you should choose backup locations that have at least 42 GB (2 x 21 GB) of disk space.

<table>
<thead>
<tr>
<th>Number of Elements</th>
<th>7 Days of As-Polled Data</th>
<th>30 Days of As-Polled Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,000</td>
<td>6 GB</td>
<td>12 GB</td>
</tr>
<tr>
<td>10,000</td>
<td>10 GB</td>
<td>21 GB</td>
</tr>
<tr>
<td>25,000</td>
<td>22 GB</td>
<td>51 GB</td>
</tr>
<tr>
<td>40,000</td>
<td>32 GB</td>
<td>77 GB</td>
</tr>
</tbody>
</table>

Tips for All Types of Database Saves

Observe the following when performing all types of database saves:

- Always perform backups using the eHealth database save commands to ensure that you can easily restore the saved database.
- Do not use Oracle tools or other third-party software to back up database files. Doing so can corrupt the database.
- Ensure that the locations to which you are saving the database have sufficient disk space for the backup. If you specify multiple locations, eHealth splits the backup data equally over the locations you specify. It does not consider available disk space.
- Do not save the database to an NFS-mounted disk or mapped drive. eHealth does not support database saves to NFS-mounted disks or mapped drives.
- On Windows systems, do not include accented characters in path names or file names. If you use accented characters, the load utility cannot identify the location and cannot load the database.
- Do not use the UNIX tape archive (tar) utility on files that are larger than 2 GB. For larger files, you must split the saved files and tar the resulting smaller files.

NOTE

eHealth deletes the previous save after you perform a new save. Therefore, you should always archive each save by copying it to another disk or using a third-party backup utility. This enables you to restore the database to the last good day, even if corruption occurred gradually.
Performing a Full Database Save

You can use the eHealth standard database save utility to perform an immediate backup of the eHealth database. The full database save is not a substitute for regularly scheduled backups, but is useful when you want to save your database manually.

You should perform a full database save at the following times:

- Before upgrading eHealth.
- Before upgrading Oracle.
- Before loading previously saved data into your database.
- Before moving the database (see “Moving the Database” on page 40).
- After you add new datafiles or move existing datafiles.

Saving a large database takes approximately one hour.

If you perform a full save to the same location as an existing save, the existing save is retained until the new save completes successfully. After the new save is validated, the prior save is deleted.

**NOTE**

To schedule automatic backups of the database, see “Implementing a Database Backup Strategy” on page 34.

To perform a full database save from the console:

1. Select **Database > Save Database** on the console. The Save Database dialog box appears.

![Save Database Dialog Box](image)

2. In the **Save Database As** field, specify the directory in which to save the database.

3. Click **Save**.

   eHealth saves the database to the specified location. Depending on the size of your database, the save can take up to one hour.

**NOTE**

You can also perform a full database save using the nhSaveDb command. This command allows you to select multiple locations for the save, which may allow the backup to complete in less time. For more information, refer to the “Commands and Environment Variables” section of the *eHealth Web Help*. 

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*eHealth Database Management Guide*
Implementing a Database Backup Strategy

An effective backup strategy ensures that you can recover your eHealth system quickly in the event of a disk failure, database corruption, or other unexpected event. Without a backup strategy, you risk spending hours or days reinstalling and reconfiguring eHealth, and can lose valuable data.

This section describes how to schedule regular database backups to protect your eHealth data. It contains the following sections:

- Best Practices for Database Backups
- Scheduling Database Backups
- Monitoring Disk Space Available for Backups
- Archiving Saves

Best Practices for Database Backups

To prevent data loss, you should save your database on a daily basis. As a best practice, follow these guidelines:

- Schedule a standard (binary) database save to occur once each day during a period of low database activity.
- Always archive several months of database saves, and keep the archives in a different physical location than the database disks. This protects the integrity of your backups, and allows you to restore the database to the last good day, even if corruption occurred gradually.
- Perform periodic universal (ASCII) saves in addition to your regularly scheduled standard saves. You would load the ASCII save only if your binary saves are corrupted or otherwise cannot be restored.
- Always perform backups using the eHealth database save commands to ensure that you can easily restore the saved database.
- Do not save the database to an NFS-mounted disk or mapped drive. eHealth does not support database saves to NFS-mounted disks or mapped drives.
Scheduling Database Backups

Scheduling regular database backups ensures that you can restore your data in the event of a system failure. You should schedule a full database save to occur daily during a period of low database activity. Any database that you restore contains only the data that was current when you last saved the database, so it is important to have a recent backup available.

eHealth does not create a backup copy of an existing database save. Each save is retained only until the next save completes successfully. After the new save is validated, the previous save is deleted. For full coverage, you should always archive each backup after the save completes.

To schedule a database backup using the Schedule Jobs dialog box:

2. Select Add Db Save from the list of default jobs. The Add Scheduled Database Save dialog box appears.

![Figure 10. Add Scheduled Database Save Dialog Box](image)

3. Under Save Database As, specify a name for the directory in which to save the database.

**NOTE**
eHealth does not support database saves to NFS-mounted disks or mapped drives.

4. Under Schedule, select on these days and select the days on which the backup occurs.
5. Specify the time at which the database backup should begin by selecting a time from the at list under Schedule. Backups do not cause system downtime, but you should schedule backups for a period of low database usage to minimize performance impacts on other scheduled jobs or ad-hoc reports.
6. Click Schedule.
7. Click OK in the Schedule Jobs dialog box.

**NOTE**
You can also schedule full database saves using the nhSchedule command. Using this command allows you to select multiple paths for your saves, which may allow the backups to complete in less time. For more information, refer to the “Commands and Environment Variables” section of the eHealth Web Help.
Monitoring Disk Space Available for Backups

After you schedule database backups, you should monitor the disk space where the backups reside, because a full disk will cause the save to fail. Use a system management agent (such as the Unicenter NSM system agent or the eHealth SystemEDGE agent) to monitor disk space. The agent can notify you when disk usage reaches a certain threshold, such as 75%, when you can take steps to acquire more disk space.

If you recently installed eHealth, note that the initial saves will be smaller and grow over time as the database fills with as-polled and rolled up data. For example, if eHealth saves 30 days of as-polled data, the database will not be full for 30 days.

Archiving Saves

After you schedule saves, establish procedures for copying the backups to tape or another system that is in a directory owned by a secure user who has read-only permissions. (Any users who have access to the saved database can restore it on another system and view all of the data that it contains.) For maximum recovery safety, the archived data should be moved offsite. You might also find it valuable to invest in a remote storage solution that obsoletes the management of tape libraries like those offered by CA BrightStor.

You should retain several months of archived backups so that you can flexibly recover eHealth data and reports. This also enables you to recover most of your data if a corruption occurred undetected over time.
Recovering the Database from a Backup

In the event of a disk failure, database corruption, or other unexpected event that causes data loss, you can restore your database from a backup.

Tips for Database Recovery

- Ensure that the eHealth system on which you load a database is at the same release or later than the system on which the database was saved. For example, you cannot load a Release 6.0 eHealth database onto a Release 5.6.5 or 5.7 system, but you can load a Release 5.6.5 or 5.7 database onto a Release 6.0 system.
- Ensure that the system onto which you are loading the database has enough free disk space to support the database. If a disk does not contain enough space, eHealth displays an error message that identifies the disk, the amount of space it is lacking, and the files on that disk. You can then add another datafile to the tablespaces on that disk, or you can move one of the tablespaces to another disk that has more space.
- Ensure that the number of files in each tablespace in the saved database is less than or equal to the number of files in each tablespace in the database in which you plan to load the saved data.
- On Windows systems, ensure that the path names and file names of the saved database do not include accented characters. If the path names contain accented characters, the load utility cannot identify the location and cannot load the database.
- If a database load fails, recreate the database using the nhDestroyDb and nhCreateDb commands, then reload the backup. For more information on these commands, see the “Commands and Environment Variables” section of the eHealth Web Help.
- If a database load is interrupted before completion, restart the load procedure. If the second load fails, recreate the database using the nhDestroyDb and nhCreateDb commands.
- When loading a standard (binary) database save, eHealth recreates the database password file and resets database passwords to ehealth for all accounts. After you load a database, always change the database passwords for eHealth admin-level accounts using the nhManageUsers command. For more information, refer to “Changing User Passwords” on page 47.”
Recovering the Database from a Standard Backup

You can restore the database to the point that the last full backup occurred. When you load the full backup, eHealth completely replaces the contents of the current database with the saved database.

The saved database files *must* be located in a directory that has a .tdb extension and is writable. In addition, if you are loading the database onto a different system (such as a backup server), the following restrictions apply:

- The systems must be of the same platform type.
- The path to which the database was saved must be identical to the path from which you are loading it.
- NH_USER and Oracle SID must be the same.
- The number of files per tablespace must match on the save and load systems.

**NOTE**

If your current database is corrupt, you *must* recreate the database using the nhDestroyDb and nhCreateDb commands before loading the backup. For more information on these commands, see the “Commands and Environment Variables” section of the eHealth Web Help.

To recover the database from a full backup:

1. Select Console > Stop Server. A confirmation dialog box appears.
2. Click Stop Server.
3. Select Database > Load Database on the console. The Load Database dialog box appears.

![Figure 11. Load Database Dialog Box](image)

4. Specify a directory in the **Load Database From** field. eHealth automatically appends the .tdb extension to the directory name.

**NOTE**

If you are loading a database onto a Windows system, ensure that the directory and file name for the saved database do not include accented characters. If they do, you must rename them with non-accented characters before the load can proceed.

5. Click **Load**. eHealth performs a standard database load.
6. After the load finishes, select **Console > Start Server**.

7. Monitor the polling status windows to verify that the poller is running.

8. Examine the database status to verify that the database loaded successfully. For instructions, refer to “Checking Disk Space Periodically” on page 16.

9. Change the database passwords for all eHealth admin-level accounts using the nhManageUsers command. For more information, refer to “Changing User Passwords” on page 47.

**NOTE**

During the database load, eHealth recreates the database password file and resets database passwords to ehealth for all accounts. After you load a database, always change the database passwords for eHealth admin-level accounts using the nhManageUsers command.

**NOTE**

You can also perform a database recovery from the command line using the nhLoadDb command. For more information, refer to the “Commands and Environment Variables” section of the eHealth Web Help.

**Recovering Element Configuration (Without a Backup)**

eHealth runs a scheduled system job called Element Configuration Backup whenever it creates a new database or upgrades the database from a previous version, but this job does not appear in the Scheduled Job dialog box. This job runs every 4 hours by default and creates a backup of the configuration in a file called elementCfgBackup.dci within the ehealth/poller directory. If you lose your database, and you do not have a saved database backup, contact Technical Support for assistance in recreating the element configuration using this file.
Moving the Database

You can move your eHealth database from one system to another. You may need to move your database because you are upgrading your hardware, or because the current system is running low on disk space. You may also want to copy your database to a non-production system for testing purposes.

The procedure you use to move the database depends on what type of system you are moving it to. Refer to the appropriate procedure for your situation:

- Moving the Database to Another System of the Same Platform Type
- Moving the Database across Platforms

**NOTE**

If you move the database to another system, that system must be running the same (or a later) release of eHealth as the system on which the database currently resides.

Moving the Database to Another System of the Same Platform Type

If you are upgrading your system to increase disk space, or want to copy the database to a non-production server, you can use the standard full save feature to move the database.

When moving your database to another system of the same platform type, the following restrictions apply:

- The path to which the database was saved must be identical to the path from which you are loading it.
- NH_USER and Oracle SID must be the same.
- The number of files per tablespace must match on the save and load systems.

**NOTE**

You can move your eHealth database to a different platform using a universal save and load. For more information, see “Moving the Database across Platforms” on page 42.

To move your database:

1. Determine the amount of space currently used by the database. Run the nhDbStatus command or select **Database > Status** from the console as described in “Checking Disk Space Periodically” on page 16. If you plan to move the database to another system, include the total space currently used by eHealth.
2. Select a new location for the database. Verify the name and the available disk space of the new location by entering the command listed in Table 7.

<table>
<thead>
<tr>
<th>Platform</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solaris</td>
<td><code>df -ak</code></td>
</tr>
<tr>
<td>HP-UX</td>
<td><code>bdf</code></td>
</tr>
<tr>
<td>Windows</td>
<td><code>dir/s</code></td>
</tr>
</tbody>
</table>

**NOTE**

On a Solaris or HP-UX system, the command displays the available disk space for all mounted disks.
3. Save a copy of the current database, as described in “Performing a Full Database Save” on page 33.
4. On the new system, select **Console > Stop Server**. A confirmation dialog box appears.
5. Click **Stop Server**.
6. Select **Database > Load Database** on the console. The Load Database dialog box appears.

![Load Database Dialog Box](image)

**Figure 12. Load Database Dialog Box**

7. Specify the directory containing the saved database.

**NOTE**

If you are loading a database onto a Windows system, ensure that the directory and file name for the saved database do not include accented characters. If they do, you must rename them with non-accented characters before the load can proceed.

8. Click **Load**. eHealth begins a standard database load.
9. eHealth checks the system on which you are performing the load to ensure that it has sufficient space and that the number of files per tablespace is sufficient for the loaded database.
   - If the system has sufficient space, eHealth loads the saved files into the new database.
   - If a disk does not contain enough space, eHealth displays an error message that identifies the disk, the amount of space it is lacking, and the files on that disk. If this occurs, add another datafile to the tablespaces on that disk, or move one of the tablespaces to another disk that has more space.
10. After the load finishes, select **Console > Start Server**.
11. Monitor the polling status windows to verify that the poller is running.
12. Examine the database status to verify that the database loaded successfully. For instructions, refer to “Checking Disk Space Periodically” on page 16.
13. Change the database passwords for all eHealth admin-level accounts using the nhManageUsers command. For more information, refer to “Changing User Passwords” on page 47.
Moving the Database across Platforms

You can use a universal save and load to move your eHealth database to another platform. For example, you could save an eHealth database on a UNIX system and then load it into an eHealth database that is running on a Windows system.

Universal saves are also path-independent, which means that you can save them to any directory and load them to a different directory on the same system or another system, and language-independent, which means that you can load an English database onto a French, Spanish, or Japanese system. You cannot, however, load a Japanese database onto an English, French, or Spanish system.

**NOTE**

When you save a database using the universal save method, you can load it into a system that has a different Oracle SID and a different eHealth user from the one in which you saved the database.

When you are performing universal saves, follow these guidelines:

- If you encounter errors during a universal save, refer to the ehealth/log/load.log and save_dir.tdb/oracle_export/exp.log files.
- Universal saves consume more disk space than full (standard) saves. You can, however, compress universal saves considerably (for example, to a compression ratio of four times or more).
- The time to perform a universal load is considerable: it could take up to eight hours to load an extra-large database. Be sure to set aside enough time to perform the load.
- On Windows systems, do not include accented characters in directory and file names.

**NOTE**

If you are unfamiliar with performing universal saves and loads, contact Technical Support before you perform the tasks described in this section.

To save and load the database across platforms:

1. Create a directory with a .tdb suffix (for example, /home/myDb.tdb).
2. Enter the nhSaveDb command in a form similar to the following:
   ```
   nhSaveDb -p /home/myDb.tdb -ascii
   ```
3. Once you have saved the database, move the files from the directory that you created in Step 1 to a directory on the destination system. The destination directory name must also have a .tdb suffix.
4. At the destination system, stop the eHealth server and use the Load Database dialog box or the nhLoadDb command to load the database files.
5. eHealth checks the system on which you are performing the load to ensure that it has sufficient space and that the number of files per tablespace is sufficient for the loaded database.
   - If the system has sufficient space, eHealth loads the saved files into the new database.
   - If a disk does not contain enough space, eHealth displays an error message that identifies the disk, the amount of space it is lacking, and the files that exist on that disk. If this occurs, add another datafile to the tablespcaces on that disk, or move one of the tablespcaces to another disk that has more space.
6. Once the load database process finishes, restart the eHealth server.
Moving Distributed eHealth Databases

You cannot load a database backup that was created on a Distributed eHealth System onto a Distributed eHealth Console (or vice versa). If you have a Distributed eHealth system, you must replicate the object information after you load the database. For more information about this process, refer to the Distributed eHealth Administration Guide.

NOTE

If you are loading the database into a Distributed eHealth System, refer to the Distributed eHealth Administration Guide for instructions on synchronizing the system after the load finishes.
This chapter describes how to perform various eHealth database administration tasks. It includes the following sections:

- “Stopping the Database”
- “Ensuring Database Security”
- “Changing the Model Size of the Database”
- “Modifying the Oracle Network Configuration”
- “Viewing the Status of the Database”
Stopping the Database

If you are shutting down the eHealth system, you should first stop the database so that connections can be closed in an orderly way before shutdown. You may also need to stop the database if you change the eHealth system hostname, or when troubleshooting system problems.

The nhStopDb command stops the database, provided that other processes are not still connected to it. Before you run this command, you must stop these other processes. You can use the nhStartDb command to restart the database manager, as described in the “Commands and Environment Variables” section of the eHealth Web Help. The database manager automatically starts when you reboot the workstation.

To stop the database manager, you can use any of the following methods:

- A normal shutdown waits for all users to disconnect, prohibits new users from connecting to the database, closes and dismounts the database, and then shuts down the instance. This is the default action.
- An immediate shutdown backs out any uncommitted user transactions, logs out all users, and then shuts down the database. A recovery is not required upon startup.
- An abort shutdown stops the database just as it is, with operations pending or not; it requires a recovery on startup. You should only use this method for emergencies.

**NOTE**

Before shutting down a UNIX workstation, always stop the database server.

---

**To stop the database manager:**

1. Stop the eHealth server using one of the following methods:
   - If the eHealth console is open, select Console > Stop Server. A confirmation dialog box appears. Click Stop Server.
   - Enter the following command in a terminal window:

     ```bash
     nhServer stop
     ```

2. If you are on a UNIX system, log in as root.

3. Enter one of the following commands, where `ehealth` denotes the eHealth home directory and `option` denotes the type of shutdown (normal, immediate, or abort):
   - `/ehealth/bin/nhStopDb option` (on UNIX systems)
   - `nhStopDb option` (on Windows systems)
Ensuring Database Security

To ensure that your eHealth database is secure, follow these guidelines:

- Every time you load a database, change the database passwords for all eHealth admin-level accounts.
- Keep archived copies of your database saves in a secure location. That is, ensure that you save the database in a directory that is owned by a secure user who has read-only permissions. (Any users who have access to the saved database can restore it and view all of the data that it contains.)
- Ensure that the eHealth user does not have database administrator permissions for the Oracle database.
- Change user passwords and manage user permissions using the nhManageUsers command. For more information, refer to the next section, “Changing User Passwords.”
- Change passwords for the following default accounts: sys, system, dbsnmp, and NH_USER. To obtain access to a list of all database users, see “To obtain a list of all accounts on your system:” on page 47.

**Caution**

Change passwords *only* using eHealth tools. *Never* change passwords directly through Oracle, since doing so could disable eHealth.

Changing User Passwords

When the installation program creates the eHealth database, it changes the passwords of the Oracle sys and system accounts to ehealth to maintain system security. You can use the nhManageUsers command to change these passwords. If you choose to change these passwords to provide additional security, you must remember the new passwords and supply them when necessary.

You can add new users and set their permissions. The eHealth administrator can add, list, modify, and delete user and system passwords for *all* users. Other users can edit their own passwords *only*.

When users connect to the database (by running commands to add new users, perform database loads, or destroy the database), eHealth prompts them to supply a password. If a user does not have the appropriate permissions to perform the specified action, eHealth returns an error message and prevents the action.

If the password file is lost or corrupted, contact Technical Support for help generating a new file.

Obtaining a List of All Accounts

Before you change passwords, obtain a list of all user accounts in your system.

**To obtain a list of all accounts on your system:**

1. Log in as the eHealth user.
2. Enter the following at the command prompt:

```
    nhManageUsers -list
```

A list of all database accounts similar to the following appears:

<table>
<thead>
<tr>
<th>Username</th>
<th>Privilege</th>
</tr>
</thead>
<tbody>
<tr>
<td>nhuser</td>
<td>admin</td>
</tr>
<tr>
<td>sys</td>
<td>admin</td>
</tr>
<tr>
<td>system</td>
<td>admin</td>
</tr>
<tr>
<td>cmi04</td>
<td>readonly</td>
</tr>
<tr>
<td>nhlistener</td>
<td>readonly</td>
</tr>
</tbody>
</table>
Managing User Accounts

You can use the nhManageUsers command to change user passwords and privileges, add new users, and to list users and their privileges. Table 8 provides the syntax you can use with the command.

<table>
<thead>
<tr>
<th>Action</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adding users</td>
<td>nhManageUsers -add -user db_account -priv [admin</td>
</tr>
<tr>
<td>Deleting users</td>
<td>nhManageUsers -delete -user db_account</td>
</tr>
<tr>
<td>Listing user passwords</td>
<td>nhManageUsers -showPass -user db_account</td>
</tr>
<tr>
<td>Modifying user passwords</td>
<td>nhManageUsers -modPass -user db_account</td>
</tr>
<tr>
<td>Listing all users and their privileges</td>
<td>nhManageUsers -list</td>
</tr>
<tr>
<td>Listing user privileges for a single user</td>
<td>nhManageUsers -showPriv -user db_account</td>
</tr>
<tr>
<td>Modifying user privileges</td>
<td>nhManageUsers -modPriv -user db_account -priv [admin</td>
</tr>
<tr>
<td>Modifying the salt value</td>
<td>nhManageUsers -passPhrase</td>
</tr>
<tr>
<td>Modifying the password for listener</td>
<td>-modPass -listener</td>
</tr>
</tbody>
</table>

Table 8. nhManageUsers Options

For detailed information about the nhManageUsers command, refer to the “Commands and Environment Variables” section of the eHealth Web Help.

To change a user password:

1. Log in as a user with admin privileges.
2. Change the password by entering the following:

   nhManageUsers -modPass -u user

3. At the prompts, supply the old password and the new password; then verify the new password.

Creation of the Database Password File

eHealth recreates the database password file after you perform a load for standard saves. That is, after a standard database load, it resets the password file to use ehealth as the password for all accounts. For universal saves, however, it resynchronizes the password file so that the original password that was in use on the system remains valid even after you load a database that used a different eHealth user name and password. For example, if you load a database with the eHealth user named bill into a database that has an eHealth user named bsmith, the password of bsmith after the load is the same as it was before the load. However, eHealth moves the bill account to bsmith and it no longer exists as its own account.
Changing the Model Size of the Database

An incorrectly configured database size can impact the performance of the Oracle database. The size of the database is determined during installation, based on information you enter for the type and number of elements to poll and the number of tablespaces to use for the database.

Your database grows and allocates disk space at a specific rate, based on the number of statistics elements that you have created for it to manage. If you plan to change your database size significantly (for example, if you had originally created a database to manage 5,000 elements and you are now planning to manage 20,000 elements), you may need to change the model size of the database.

Before changing the model size of the database:

1. Use the eHealth Sizing Wizard to determine whether you have enough disk space to support the number of elements that you want to monitor.
2. Add datafiles to your tablespaces (if necessary) by using the nhManageDbSpace command. For instructions, refer to “Managing the Size of Tablespaces” on page 63.

To change the database model size:

1. Shut down the eHealth server by selecting Console > Stop Server.
2. Close eHealth by selecting Console > Quit.
3. Enter the following at a command prompt, selecting one of the four size options:

   \texttt{nhChangeDbModelSize [-small|-medium|-large|-xlarge]}

   For example, to specify that you want to create a medium-sized database, enter the following:

   \texttt{nhChangeDbModelSize -medium}

4. Restart eHealth:
   - On Windows systems, select Start > Programs > eHealth 6.0 > eHealth.
   - On UNIX systems, enter ehealth from the /ehealth/bin directory.

\textbf{NOTE}

The nhChangeDbModelSize command does not resize existing tables. This command inserts new tables or new rows into existing tables by conforming to the new model size that you specified. Oracle allocates extents when the previously allocated extents do not have any room left. If you change the model size, but the existing extents are not used completely, the size of the database does not change. The command adds a new extent using the new size that you specified only after all blocks in existing extents are full.
Resizing the eHealth Database

If you delete a large part of a database (either by deleting hundreds of elements or removing Report Center and its time-aligned statistics database), the disk space is not automatically returned as “free space.” You should resize your eHealth database to optimize the database disk space usage and regain any space that is no longer needed by the database files.

To regain the disk space, you can export the current database, destroy and recreate the database, and then load the exported database. This creates a new database that is more space efficient, and returns any unused disk space as free space for the disks on which the database files reside. The process does result in some downtime for the eHealth server while the database is being destroyed and created, and while the database is being loaded. Try to schedule this task to occur on a weekend or during a period of low activity.

To resize the eHealth database:

1. Log in to the eHealth system as the eHealth administrator. If the system is a UNIX system, change to the eHealth home directory and source the nethealthrc file to set the environment variables.

2. Export the current eHealth database using the following command, where saveDir is the directory where you want to save the exported database. This command assumes that you intend to reload the database on the current eHealth system and takes advantage of the -fast option to reduce the time needed to export the database.

   \[ \text{nhSaveDb} \ -\text{ascii} \ -\text{fast} \ -\text{compress} \ -p \ \text{saveDir} \]

3. After the export process completes, destroy the current database using the following command, where SID is the name of the eHealth database (usually EHEALTH). For UNIX eHealth systems, you must log in as the root user to complete this step, as well as the following step.

   \[ \text{nhDestroyDb} \ -s \ \text{SID} \]

4. Create a new database using the nhCreateDb command. The command launches an interactive script that prompts you for information about the database. If you used a layout configuration file (LCF) to specify the database locations and create a tailored database for your environment, use the command “nhCreateDb -i lcfPathname” where lcfPathname is the pathname to the LCF file. For UNIX eHealth systems, you must be the root user to complete this step.

5. Load the exported database using the command “nhLoadDB -p saveDir” where saveDir is the location of the exported database from Step 2.

After the load completes, the eHealth database should consume a smaller amount of disk space, and there should be more free space reported for the database disk locations and tablespaces.
Modifying the Oracle Network Configuration

The eHealth installation program automatically configures the network interface for Oracle. However, you may need to modify the configuration if you make network changes. You can use the nhConfigDbNet command to modify the Oracle network interface.

Table 9 provides the syntax you can use with the command.

<table>
<thead>
<tr>
<th>Action</th>
<th>Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modify the port number</td>
<td><code>nhConfigDbNet -addListener -port portNumber</code></td>
</tr>
<tr>
<td>Modify the Oracle instance (sid)</td>
<td><code>nhConfigDbNet -addListener -sid oracleSid</code></td>
</tr>
<tr>
<td>Modify the listener (listener.ora file)</td>
<td><code>nhConfigDbNet -addListener -listenername listenerName</code></td>
</tr>
<tr>
<td>Update the tnsnames.ora file</td>
<td><code>nhConfigDbNet -addTnsNames</code></td>
</tr>
</tbody>
</table>

For detailed information about the nhConfigDbNet command, refer to the “Commands and Environment Variables” section of the eHealth Web Help.

**To change the port number and oracle SID:**

1. Log in as a user with admin privileges.
2. Enter the following command:
   
   `nhConfigDbNet -addListener -sid oracleSid -port portNumber`
Viewing the Status of the Database

eHealth provides summary information about the status of the entire database, all of its tablespaces, and the datafiles associated with each tablespace through the Database Status dialog box. It also provides specific information about statistics and conversations data.

To view the current status of the database:

1. Select **Database > Status** on the console. The Database Status dialog box appears.

![Database Status Dialog Box](image)

2. If a poll occurs while the dialog box is open, click **Refresh** to update the fields.

3. Select the **Statistics** tab to obtain information about statistics data, including data for LAN/WAN, remote access, response, router, QoS, Mobile Wireless, VPN, application, and system elements.

4. Select the **Conversations** tab to obtain information about data collected for Traffic Accountant probes.
Table 10 describes the summary information that appears at the top of the Database Status dialog box.

Table 10. Database Summary Information

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database Name</td>
<td>Name of the eHealth database (default is EHEALTH).</td>
</tr>
<tr>
<td>Database Size</td>
<td>Current size of the entire database in kilobytes (K), megabytes (M), or gigabytes (G).</td>
</tr>
<tr>
<td>RDBMS Version</td>
<td>Version number of the database software.</td>
</tr>
<tr>
<td>Tablespace</td>
<td>Name of the tablespace. You can have up to nine tablespaces.</td>
</tr>
<tr>
<td>Free Space in Datafile</td>
<td>Amount of free space in each datafile. The datafile will automatically extend when free space runs out.</td>
</tr>
<tr>
<td>Free Space On Device</td>
<td>Amount of unused disk space on the disk containing the tablespace (in megabytes). If you do not have sufficient space, you can move datafiles to a tablespace on another disk. For more information, refer to “Managing the Size of Tablespaces” on page 63.</td>
</tr>
<tr>
<td>Datafile Path</td>
<td>Pathname of the disk that contains this tablespace.</td>
</tr>
</tbody>
</table>

The Statistics tab provides information about statistics data, including data about LAN/WAN, remote access, response, router, QoS, Mobile Wireless, VPN, application, and system elements. Table 11 describes the fields for the statistics database.

Table 11. Statistics Database Fields

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elements</td>
<td>Total number of statistics elements in the database, including those for which polling is not enabled</td>
</tr>
<tr>
<td>Database Size</td>
<td>Current size of the database for statistics data in kilobytes (K), megabytes (M), or gigabytes (G)</td>
</tr>
<tr>
<td>Location(s)</td>
<td>Name of database location containing statistics data</td>
</tr>
<tr>
<td>Latest Entry</td>
<td>Date and time of most recent entry in database for statistics data</td>
</tr>
<tr>
<td>Earliest Entry</td>
<td>Date and time of first entry in database for statistics data</td>
</tr>
<tr>
<td>Last Rollup</td>
<td>Date and time of most recent attempted rollup of database for statistics data</td>
</tr>
</tbody>
</table>
The Conversations tab provides information about data collected from Traffic Accountant probe elements (Figure 14).

![Database Status Conversations Tab]

Table 12 describes the fields for the conversations database.

### Table 12. Conversations Database Fields  (Page 1 of 2)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probes</td>
<td>Total number of probes in poller configuration</td>
</tr>
<tr>
<td>Nodes</td>
<td>Total number of nodes observed by the probes</td>
</tr>
<tr>
<td>As Polled Conversations</td>
<td></td>
</tr>
<tr>
<td>Database Size</td>
<td>Current size of the database for as-polled conversations data in kilobytes (K), megabytes (M), or gigabytes (G)</td>
</tr>
<tr>
<td>Location(s)</td>
<td>Name of the database location that contains as-polled conversations data</td>
</tr>
<tr>
<td>Latest Entry</td>
<td>Date and time of the most recent entry in the database for as-polled conversations data</td>
</tr>
<tr>
<td>Earliest Entry</td>
<td>Date and time of the first entry in the database for as-polled conversations data</td>
</tr>
<tr>
<td>Last Rollup</td>
<td>Date and time of the most recent attempted rollup of the database for as-polled conversations data; this may appear as failed until rollups run for the first time.</td>
</tr>
</tbody>
</table>
### Table 12. Conversations Database Fields (Page 2 of 2)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rolled Up Conversations</strong></td>
<td></td>
</tr>
<tr>
<td>Database Size</td>
<td>Current size of the database for the rolled-up all conversations data in kilobytes (K), megabytes (M), or gigabytes (G)</td>
</tr>
<tr>
<td>Location(s)</td>
<td>Name of the database location that contains rolled-up conversations data</td>
</tr>
<tr>
<td>Latest Entry</td>
<td>Date and time of the most recent entry in the database for rolled-up all conversations data</td>
</tr>
<tr>
<td>Earliest Entry</td>
<td>Date and time of the first entry in the database for rolled-up all conversations data</td>
</tr>
<tr>
<td><strong>Rolled Up Top Conversations</strong></td>
<td></td>
</tr>
<tr>
<td>Database Size</td>
<td>Current size of the database for rolled-up top conversations data in kilobytes (K), megabytes (M), or gigabytes (G)</td>
</tr>
<tr>
<td>Location(s)</td>
<td>Name of the database location that contains rolled-up top conversations data</td>
</tr>
<tr>
<td>Latest Entry</td>
<td>Date and time of the most recent entry in the database for rolled-up top conversations data</td>
</tr>
<tr>
<td>Earliest Entry</td>
<td>Date and time of the first entry in the database for rolled-up top conversations data</td>
</tr>
</tbody>
</table>
This chapter describes issues that you might encounter while working with the database, including:

- Troubleshooting Database Connection Problems
- Troubleshooting Database Disk Space Problems
- Troubleshooting Report Failures

**Troubleshooting Database Connection Problems**

If you cannot connect to the eHealth database, perform the following procedures to troubleshoot the problem:

- Confirm that you have access to the database.
- Confirm that Oracle is running.
- Start the database.
- Verify that the database exists.
- Force the database to restart.

**Confirming That You Have Database Access**

To confirm that you have access to the database:

1. Enter the following command at the command prompt:
   
   `sqlplus`

2. Enter your database user name and password.

3. If you cannot log in, you do not have access to the database. Verify your user name, password, and permissions. If you do have access to the database, determine whether Oracle is running.

4. If you logged in successfully but cannot connect to the database, check to see if Oracle is running.
Confirming that Oracle is Running

To confirm that Oracle is running:

1. Enter the following at a command prompt:
   ```bash
   ps -ef | grep $ORACLE_SID
   ```
2. Check the output of this command for the following processes:
   - pmon
   - smon
   - dbw
   - arc
   - ckpt
   - rec
3. If these processes are not running, start the database, as described in the following procedure.
4. If the processes are running (UNIX only), enter the following command and check for a list of Oracle shared memory segments:
   ```bash
   ipcs -a
   ```
   If the shared memory segments are not present, the database instance is either not started or is in an inconsistent state.
5. If Oracle is running and you still cannot connect to the database, start the database.

Starting the Database

To start the database:

1. Enter the following at the command prompt:
   ```bash
   nhStartDb
   ```
2. Verify that the database has started by repeating the previous procedure “Confirming that Oracle is Running” on page 58."
3. Try to connect to the database, as described in “Confirming That You Have Database Access” on page 57.
4. If you cannot start the database and its processes are not running, verify that it exists.

Verifying that the Database Exists

To verify that the database exists:

1. Verify that the parameter initialization file exists:
   - On UNIX systems, look for the following file:
     `$ORACLE_HOME/dbs/initORACLE_SID.ora`
   - On Windows systems, look for the following file:
     `%ORACLE_HOME%\database\initORACLE_SID.ora`
2. Change directory to the location in which you installed the database tablespaces. For example, if you installed the tablespaces in `D:\database`, enter the following:
   ```bash
   cd D:\database
   ```
3. Verify that the following files exist in the same directory:
   - `databaseDir/ctl/control.ctl.ora`
   - `databaseDir/oradata/system*.dbf`
   - `databaseDir/oradata/index*.dbf`
   - `databaseDir/oradata/rds*.dbf`

4. If these files do not exist, you must install the database. For information, refer to the eHealth Installation Guide for your platform.

5. If these files exist, your database is installed. If you still cannot connect to the database, force it to restart.

**Forcing the Database to Restart**

To force the database to restart on a UNIX system:

1. Enter the following at a command prompt:
   ```
   sqlplus "/ as sysdba"
   shutdown immediate
   ```

2. Wait 30 seconds for the database to shut down, then enter the following commands:
   ```
   startup
   exit
   ```

3. Restart the Oracle database service by entering `nhStartDb` from the `/ehealth/bin` directory.

4. Restart your system.

To force the database to start on a Windows system:

1. Stop the Oracle database service by selecting `Start > Control Panel > Services`, selecting `OracleServiceORACLE_SID`, and clicking `Stop`.

2. Recreate the service by entering the following commands:
   ```
   oradim -delete -sid ORACLE_SID
   oradim -new -sid ORACLE_SID -startmode auto -pfile ORACLE_HOME\database\initORACLE_SID.ora
   ```

3. Enter the following at a command prompt:
   ```
   sqlplus "/ as sysdba"
   shutdown immediate
   ```

4. Wait 30 seconds for the database to shut down, then enter the following commands:
   ```
   startup
   exit
   ```

5. Restart the Oracle database service by selecting `Start > Control Panel > Services`; then select `OracleServiceORACLE_SID` and click `Start`.

6. Restart your system.

**NOTE**

If you still cannot connect to the database after performing these procedures, contact Technical Support.
Troubleshooting Database Disk Space Problems

If the disks containing the eHealth database run low on space, the following problems can occur:

- At-a-Glance reports for the eHealth system show disk space problems.
- The eHealth console indicates report failures.
- Traps from SystemEDGE and the Oracle AIM reveal Oracle space problems.
- The database manager or eHealth fail to start.

Disk space problems can be caused by a fragmented database, unnecessary files that consume large amounts of space, or because a disk is unable to accommodate the volume of eHealth activity.

**NOTE**

These symptoms may also indicate that you need to add a datafile to a tablespace, move a datafile from one tablespace to another, or change a setting in the initialization parameter file. This file is located in the database (Windows) or dbs (UNIX) subdirectory of $ORACLE_HOME and is named initORACLE_SID.ora. For instructions on adding and moving datafiles, refer to “Managing the Size of Tablespaces” on page 63.

This section describes how to examine the disk and free up some space. If you need assistance with these procedures, contact Technical Support.

**Examining the Disks**

To determine whether a disk is large enough for the volume of eHealth activity that you are experiencing, you should examine the amount of available space on the disk.

**To determine available disk space on the disk:**

1. Select Database > Status on the eHealth console. The Database Status dialog box opens.
2. Examine the Free Disk Space field to determine the amount of free space on the disk. If the disk has less than 1 MB free, the disk is full.
3. Compare the amount of space used by the database to the available disk space to determine what is consuming disk space:
   - If the two values are very close, the database is using most of the space. To allow the database manager to reclaim some of its space, refer to “Ensuring the Database Is Using Space Efficiently” on page 61.
   - If the database is not using most of the space, clean up the disk as described in “Cleaning Up the Disks” on page 61.
   - If the command indicates that the disk is not full, you may have a full tablespace. Refer to “Managing the Size of Tablespaces” on page 63.
Reclaiming Disk Space

Before you increase the size of your physical disks, ensure that your current disk space is being used efficiently by:

- Ensuring the database is using space efficiently
- Cleaning up the disks

Ensuring the Database Is Using Space Efficiently

If the database is consuming most of the disk space:

- Ensure that the data rollup jobs and other scheduled jobs described in “Using Scheduled Jobs to Control Database Growth” on page 22 are running regularly.
- Shut down and restart the database to allow the database manager to reclaim some of its space. For more information, refer to “Stopping the Database” on page 46.
- Move datafiles to other disks by following the instructions provided in “Moving a Datafile” on page 64.

Cleaning Up the Disks

If other (non-database) files are consuming a large amount of disk space, you can free space by:

- Deleting core files (UNIX systems only).
- Deleting temporary files.
- Deleting old report files.
- Using the nhExpire command or the Scheduled Jobs dialog box to eliminate old jobs.
- Making sure that your disks contain only files that belong to eHealth and Oracle. Delete any other applications and related files. Your eHealth system should be dedicated to eHealth.

**NOTE**

Do not delete files that you do not recognize or you may damage the eHealth system.

These actions will not alleviate the need for more disk space if the database is growing significantly, but they are essential for maximizing existing disk space.

Deleting Core Files. You should delete core files on a regular basis. Core files are generally large, and can be deleted unless you are using them to troubleshoot application problems.

To identify core files, enter the following command, where /disk is the pathname for the database disk:

```
find /disk -name core -print
```

Deleting Temporary Files. When you generate eHealth reports using the console or the Web interface but do not save them, eHealth saves the files in the /ehealth/tmp and /ehealth/web/tmp directories, respectively.

Deleting Old Report Files. When you save reports as ASCII, PostScript, encapsulated PostScript (EPS), or portable document format (PDF), eHealth saves the files in the /ehealth/output directory by default. When you output eHealth reports to the Web, the system saves them in the /ehealth/web/output directory.
To free disk space, you can use the following two methods:

- Run the nhExpire command to delete old report files and temporary files from the output, web, and tmp directories. For more information on this command, refer to the “Commands and Environment Variables” section of the eHealth Web Help.

- Clean up these directories on a regular basis by modifying the Delete Old Reports job to change the number of days that eHealth retains the reports and temporary files, as well as when the job runs. To maintain disk space and clean up old files, eHealth automatically runs this job at 6:00 A.M. daily to delete the following files:
  - ASCII, EPS, PDF, or Postscript report files in the output directory that are older than 31 days
  - Temporary files in the /ehealth/tmp and /ehealth/web/tmp directories (including PDF files) that are older than four days
  - Web-based reports in the directories listed in Table 13 that are older than 31 days

<table>
<thead>
<tr>
<th>Report</th>
<th>Directory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health, Service Level, and Top N</td>
<td>/ehealth/web/output/groups</td>
</tr>
<tr>
<td>Service Level</td>
<td>/ehealth/web/output/groupLists</td>
</tr>
<tr>
<td>Trend and At-a-Glance</td>
<td>/ehealth/web/output/users</td>
</tr>
<tr>
<td>Traffic Accountant</td>
<td>/ehealth/web/output/views</td>
</tr>
</tbody>
</table>

### Reducing Demands on Disk Space

If you are unable to free significant space on your disk by reclaiming disk space, the size of your disk might be inadequate for the volume of eHealth activity.

To reduce the demands of eHealth on disk space, you could do one of the following:

- Set a longer polling interval, as described in the eHealth Element and Poller Management Guide.
- Move the database to a new disk, as described in “Moving the Database” on page 40.
- Move datafiles to tablespaces that are located on other disks, as described in “Moving a Datafile” on page 64.
Managing the Size of Tablespaces

If you encounter any of the following problems, a full tablespace might be the root cause:

- Messages in the $ORACLE_HOME/admin/bdump/$ORACLE_SID/alert_$ORACLE_SID.log file stating that you are out of disk space
- Oracle error message: ORA-1652: unable to extend temp segment error
- Oracle warning messages that you are out of disk space or have exceeded the maximum number of blocks
- A data analysis failure with an Oracle out of disk space error

To troubleshoot these errors, check disk space as described on “Checking Disk Space Periodically” on page 16. After checking disk space, you may be able to resolve the errors by adding a datafile to extend the tablespace or moving a datafile to a device with more free disk space.

If you are experiencing errors and a tablespace has more than one datafile and at least one datafile is not approaching the 32 GB limit, contact Technical Support.

Adding a Datafile

When a tablespace is full, you can add another datafile as long as the amount of disk space that you specify for the datafile size is available.

The command syntax for adding a datafile is as follows:

```
  nhManageDbSpace [-evaluate] -add -newPath directory -tablespace tablespace -size fileSize
```

- `directory` represents the path to the top-level database directory in which you want to add the datafile. eHealth will create the appropriate directory structure within the specified directory.
- `tablespace` represents the name of the tablespace to which you want to add a datafile.
- `fileSize` represents the initial size (in megabytes) of the new datafile.
- `-evaluate` is an optional argument that you can use to test the command syntax and to find out if adequate space exists on the device.

**Example of adding a datafile of 100 MB to the NH_DATA01 tablespace:**

1. Enter the following command, where `/export/blue11/oradata/EHEALTH` is the path to the new datafile and EHEALTH is the name (session ID) of the eHealth database:

   ```
   nhManageDbSpace -add -newPath /export/blue11/oradata/EHEALTH -tablespace NH_DATA01 -size 100
   ```

2. Confirm the location of the new datafile by reviewing the layout configuration file (LCF):

   ```
   more /opt/eHealth/oracle/database/blue_EHEALTH.lcf
   ```
   where blue is the name of the system and EHEALTH is the name of the database.

**NOTE**

If you destroy and recreate the database at a later time, make sure that you provide the LCF as input to the `nhCreateDb` command. This enables the command to create a database with the correct number of datafiles.
Moving a Datafile

If the NH_INDEX, NH_USERS, NH_DATA01, or NH_DATA02 tablespace is running out of disk space, you can move the datafile or datafiles to a tablespace on a larger disk on the eHealth system. If possible, you should try to keep the largest tablespaces (NH_INDEX, NH_DATA01, and NH_DATA02) on separate disks or partitions. NH_INDEX should reside on the largest disk with the highest input/output performance. NH_DATA01 should reside on the next largest disk with the next highest input/output rate. Apply these guidelines for NH_DATA02.

**NOTE**

Moving a datafile requires stopping the eHealth server. Only perform this procedure when access to eHealth reports, the eHealth Web console, and Live Health are not required.

The command syntax for moving a datafile is as follows:

```
nhManageDbSpace [-evaluate] -move -datafile datafile -newPath directory
```

- `datafile` represents the full path to the `.dbf` file that you want to move.
- `directory` represents the path to the top-level database directory in which you want to place the datafile. eHealth will create the appropriate directory structure within the specified directory.
- `-evaluate` is an optional argument that you can use to test the command syntax and to find out if adequate space exists on the target device.

To move a datafile for the NH_INDEX01 tablespace:

1. Confirm the path to the datafile that you want to move. This information is available in the Database Status dialog box.
2. Stop the eHealth server by entering the following:
   ```
nhServer stop
```
3. To test the command syntax and confirm that adequate space exists, enter the following command:
   ```
nhManageDbSpace -evaluate
   -move -datafile /export/myHost/oradata/EHEALTH/NH_INDEX01.dbf
   -newPath /export/myHost1
```
4. If the output includes no errors, move the datafile by entering the following:
   ```
nhManageDbSpace -move -datafile /export/myHost/oradata/EHEALTH/NH_INDEX01.dbf
   -newPath /export/myHost1
```
5. Review the output to ensure that the command has moved the datafile:
   ```
   Moving file ...
   Created: /export/myHost/eh570/oracle/database/myHost_EHEALTH.lcf.2004-08-11-0842
   Updated: /export/myHost/eh570/oracle/database/myHost_EHEALTH.lcf
   ```
   After moving the datafile, the nhManageDbSpace command renames the existing layout configuration file and generates a new one. `myHost_SID.lcf` is always the name of the latest LCF where `myHost` represents the system name and `SID` represents the database name.
6. Confirm the new location of the NH_INDEX01.dbf datafile by entering the following:
   ```bash
grep NH_INDEX $NH_HOME/oracle/database/myHost_EHEALTH.lcf
   ```

7. Start the eHealth server by entering the following:
   ```bash
   nhServer start
   ```

**NOTE**
If you destroy and recreate the database at a later time, make sure that you provide the LCF as input to the nhCreateDb command. This enables the command to create a database with the correct number of datafiles.

---

**Troubleshooting Report Failures**

If you run a large number of reports and any of them fail, you can edit the `init<sid_name>.ora` file, where `<sid_name>` is the name of the Oracle instance. For Windows systems, this file is located at `/ehealth/oracle/database`; for UNIX systems, it is located at `/ehealth/oracle/dbs`. Increase the value of the PROCESSES parameter, which defines user processes, to 250.
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