ZENworks® 2017 Update 4

Database Management Reference

January 2019

Legal Notice

For information about legal notices, trademarks, disclaimers, warranties, export and other use restrictions, U.S. Government rights, patent policy, and FIPS compliance, see https://www.novell.com/company/legal/.

© Copyright 2008-2019 Micro Focus or one of its affiliates.

The only warranties for products and services of Micro Focus and its affiliates and licensors ("Micro Focus") are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Micro Focus shall not be liable for technical or editorial errors or omissions contained herein. The information contained herein is subject to change without notice.

About This Guide

This *ZENworks Database Management Reference* provides information to help you back up and restore an embedded or external Sybase SQL Anywhere database by using the zman command line utility. To back up and restore Oracle or Microsoft SQL Server databases, refer to their documentation.

The guide also helps you migrate data from a Sybase SQL Anywhere database to an Oracle database or to an MSSQL database. The information in this guide is organized as follows:

- Part I, “Embedded Database Maintenance,” on page 9
- Part II, “External Database Maintenance,” on page 63
- Part III, “Database Management - Best Practices, Tips, Troubleshooting,” on page 123

Audience

This guide is intended for ZENworks administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the *comment on this topic* link at the bottom of each page of the online documentation.

Additional Documentation

ZENworks 2017 is supported by other documentation (in both PDF and HTML formats) that you can use to learn about and implement the product. For additional documentation, see the ZENworks documentation website.

Contents

About This Guide **3**

Part I Embedded Database Maintenance **9**

1 Retrieving and Storing the Credentials of the Embedded Sybase SQL Anywhere Database **11**

2 Changing the Ports Used by the Embedded Sybase SQL Anywhere Database **13**

3 Backing Up the Embedded Sybase SQL Anywhere Database **15**

Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server 15
Backing up the Embedded Sybase SQL Anywhere Database Running on a Windows Server to a Network Location on a Remote Windows Machine. 18
Backing up the Embedded Sybase SQL Anywhere Database Running on a Linux Server to a Network
Location on a Remote Linux Machine 20

4 Restoring the Embedded Sybase SQL Anywhere Database **23**

Restoring the Embedded Sybase SQL Anywhere Database on a Windows Server 23
Restoring the Embedded Sybase SQL Anywhere Database on a Linux Server. 25
Restoring the Embedded Sybase SQL Anywhere Database on the ZENworks Appliance Server 26

5 Moving the Data from an Embedded Sybase Database to an External Sybase Database **31**

Preparing to Move the Data. 31
Moving the Data from the Internal Sybase to the External Sybase 31

6 Moving the Internal Sybase Database from One Primary Server to Another Primary Server **35**

7 Migrating the Data from an Internal Sybase Database to an External Oracle Database **43**

Preparing to Move the Data. 43
Migrating the Data from the Internal Sybase Database to an Oracle Database 45
Migrating the Data from the Internal Sybase Database to an Oracle Database. 45
Resuming the Database Migration. 47
Post-Migration Tasks. 47

8 Migrating the Data from an Internal Sybase Database to an MS SQL Database 49

Preparing to Move the Data 49
Migrating the Data from the Internal Sybase Database to an MS SQL Database 50
Migrating the Data from the Internal Sybase Database to an MS SQL Database 51
Resuming the Database Migration 53
Post-Migration Tasks 53

9 Configuring PostgreSQL 55

10 Migrating the Data from an Internal Sybase Database to the PostgreSQL Database 57

11 Updating the Remote PostgreSQL database 59

On SLES 11 Database Server. 59
On SLES 12 Database Server. 59
On Windows Database Server 60

Part II External Database Maintenance 63

12 Backing Up the External Sybase Database 65

Backing Up the External Sybase Database on a Windows or Linux Server 65
Backing up the External Sybase Database Running on a Windows Server to a Network Location on a
Remote Windows Machine 68
Backing up the External Sybase Database Running on a Linux Server to a Network Location on a
Remote Linux Machine 72

13 Restoring the External Sybase Database 77

14 Moving the Data from One External Sybase Database to another External Sybase Database 79

Preparing to Move the Data 79
Moving the Data from One External Sybase to Another External Sybase 79

15 Moving the Data from an External OEM Sybase Database to an Embedded Sybase Database 83

Preparing to Move the Data 83
Moving the Data from the External Sybase to the Embedded Sybase 83

16 Migrating the Data from the External Sybase Database to an External Oracle Database 85

Preparing to Move the Data 85
Migrating the Data from the External Sybase Database to an Oracle Database 87
Migrating the Data from the External Sybase Database to an Oracle Database 87
Resuming the Database Migration 88

Post-Migration Tasks 88

17 Migrating the Data from the MS SQL Database to an Oracle Database 91

Preparing to Move the Data 91
Migrating the Data from the MS SQL Database to an Oracle Database 93
Migrating the Data from the MS SQL Database to an Oracle Database 93
Resuming the Database Migration 94
Post-Migration Tasks 95

18 Configuring the ZENworks Server to Point to the New MS SQL Database Containing Data Moved from Another MS SQL Database 97

Preparing to Move the Data 97
Configuring the ZENworks Server to Point to the New MS SQL Database 98

19 Configuring the ZENworks Server to Point to the New Oracle Database Containing Data Moved from Another Oracle Database 101

Preparing to Move the Data 101
Configuring the ZENworks Server to Point to the New Oracle Database 102

20 Migrating the Data from an External Sybase SQL Anywhere to an MS SQL Database 103

Preparing to Move the Data 103
Migrating the Data from the External Sybase Database to an MS SQL Database 104
Migrating the Data from the External Sybase Database to an MS SQL Database 105
Resuming the Database Migration 106
Post-Migration Tasks 107

21 Migrating 32-bit OEM Sybase database to 64-bit Sybase on a 64-bit machine 109

22 Creating External PostgreSQL Database Schema 111

23 Migrating the Data from an External Sybase Database to an External PostgreSQL Database 113

24 Migrating the Data from an Oracle Database to an MS SQL Database 115

Preparing to Move the Data 115
Migrating the Data from the Oracle Database to an MS SQL Database 116
Preparing to Move the Data 116
Migrating the Data from the Oracle Database to an MS SQL Database 117
Resuming the Database Migration 118
Post-Migration Tasks 119

25 Migrating the data from an MS SQL Server to a PostgreSQL Database **121**

Part III Database Management - Best Practices, Tips, Troubleshooting **123**

26 Database Ports **125**

27 Database Best Practices **127**

Rebuilding the Sybase Database 127

28 Database Tips **131**

Changing the ZENworks Database User Password 131
Changing the Backup Location and Schedule of the Embedded Sybase Database Subsequent to the Initial Backup 132
Changing the Backup Location of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup 132
Changing the Backup Schedule of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup 133
Changing the Backup Schedule and Location of the External Sybase Database Subsequent to the Initial Backup 133
Reverting to the ZENworks Sybase Database from the ZENworks Oracle Database 135
Identifying the EBF Version of Sybase Database Server. 136
Maximum Pool Size. 136
Verifying Invalid Objects and Indexes in the Oracle Database 136

29 Troubleshooting Database Migration **139**

After database migration ZEUS is unable to contact the new database server 139
During Appliance deployment, configuring External PostgreSQL using the New Schema option fails to create Audit database 140
Error message 404 is displayed when you log into the ZENworks Control Center 140
Troubleshooting a Java Heap Space Exception 140
Troubleshooting an Oracle Database Crash 141
Troubleshooting an Oracle Tablespace Issue 141
Troubleshooting the Database Migration Failure Issue 142
Troubleshooting the Database Migration by Using An Existing User Schema 142
Troubleshooting the ORA-01652: unable to extend temp segment by 128 in tablespace TEMP. 143
Troubleshooting the ORA-01400: cannot insert NULL. 143
Troubleshooting the ORA-12516, TNS: listener could not find available handler with matching protocol stack 143
Troubleshooting the database migration failure, duplication of serial numbers in the zDevice table. . . . 144

Embedded Database Maintenance

- Chapter 1, “Retrieving and Storing the Credentials of the Embedded Sybase SQL Anywhere Database,” on page 11
- Chapter 2, “Changing the Ports Used by the Embedded Sybase SQL Anywhere Database,” on page 13
- Chapter 3, “Backing Up the Embedded Sybase SQL Anywhere Database,” on page 15
- Chapter 4, “Restoring the Embedded Sybase SQL Anywhere Database,” on page 23
- Chapter 5, “Moving the Data from an Embedded Sybase Database to an External Sybase Database,” on page 31
- Chapter 6, “Moving the Internal Sybase Database from One Primary Server to Another Primary Server,” on page 35
- Chapter 7, “Migrating the Data from an Internal Sybase Database to an External Oracle Database,” on page 43
- Chapter 8, “Migrating the Data from an Internal Sybase Database to an MS SQL Database,” on page 49
- Chapter 9, “Configuring PostgreSQL,” on page 55
- Chapter 10, “Migrating the Data from an Internal Sybase Database to the PostgreSQL Database,” on page 57
- Chapter 11, “Updating the Remote PostgreSQL database,” on page 59

1 Retrieving and Storing the Credentials of the Embedded Sybase SQL Anywhere Database

If you have installed ZENworks with the embedded Sybase SQL Anywhere database that is bundled with ZENworks, we recommend that you store the credentials of the database for future use.

1. Retrieve the credentials of the embedded Sybase SQL Anywhere database by entering one of the following commands at the server prompt:

   `zman database-get-credentials`

   or

   `zman dgc`

   The credentials are displayed on the console.

   For more information about zman, view the zman man page (`man zman`) on the server or see "zman(1)" in the *ZENworks Command Line Utilities Reference*.

2. Copy the credentials and save them in a file.

To retrieve and store the credentials of Remote Sybase SQL Anywhere, Oracle, or Microsoft SQL Server databases, refer to their documentation.

2 Changing the Ports Used by the Embedded Sybase SQL Anywhere Database

Sybase SQL Anywhere uses port 2638 by default. You can change the port on which the database runs.

1. In the `zenworks_database.conf` file, specify the new port number on which the server listens to.

   The `zenworks_database.conf` file is located in *%ZENWORKS_HOME%*`\conf` on Windows and in `/etc/opt/novell/zenworks` on Linux.

2. In the `zdm.xml` and `zenaudit.xml` files on all the Primary Servers, specify the new port number in the following entry:

   ```
   <entry key="Port">2638</entry>
   ```

   By default, the entry lists the default port number, 2638.

   The `zdm.xml` and `zenaudit.xml` files are located in *%ZENWORKS_HOME%*`\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux.

3. Restart the database service, ZENServer, and ZENLoader services on all Primary servers:

   - **On Windows:**
     1. From the Windows desktop Start menu, click **Settings** > **Control Panel**.
     2. Double-click **Administrative Tools** > **Services**.
     3. Restart the following services: **Novell ZENworks Embedded Datastore**, **Novell ZENworks Loader Service**, and **Novell ZENworks Server**.
   - **On Linux:** At the console prompt, enter the following commands in the order given:

     On SLES 11:

     - `/etc/init.d/novell-zenmntr stop`
     - `/etc/init.d/novell-zenserver stop`
     - `/etc/init.d/novell-zenloader stop`
     - `/etc/init.d/sybase-asa restart`
     - `/etc/init.d/novell-zenserver start`
     - `/etc/init.d/novell-zenloader start`
     - `/etc/init.d/novell-zenmntr start`

     On SLES 12:

     - `systemctl stop novell-zenserver.service`
     - `systemctl stop novell-zenloader.service`
     - `systemctl restart sybase-asa.service`

- `systemctl start novell-zenserver.service`
- `systemctl start novell-zenloader.service`

Even though the TCP and UDP ports are changed from 2638, the database server also listens on UDP port 2638. For more information, see the Sybase database documentation (http://www.ianywhere.com/developer/product_manuals/sqlanywhere/1001/en/html/dbdaen10/da-serverport-network-conparm.html).

3 Backing Up the Embedded Sybase SQL Anywhere Database

The embedded Sybase SQL Anywhere database can be backed up to a directory on the local machine or to a network location.

- "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15
- "Backing up the Embedded Sybase SQL Anywhere Database Running on a Windows Server to a Network Location on a Remote Windows Machine" on page 18
- "Backing up the Embedded Sybase SQL Anywhere Database Running on a Linux Server to a Network Location on a Remote Linux Machine" on page 20

IMPORTANT: If you want to back up the ZENworks Server that hosts the ZENworks database, you must ensure that the ZENworks database is backed up at least once before backing up the ZENworks Server (which only needs to be done one time). You can also back up the ZENworks database on a regular basis. However, you can back up the server and the database in any order.

When restoring the ZENworks Server and the database, you must first restore the ZENworks Server, then restore the latest backed-up ZENworks database.

For more information about backing up and restoring the ZENworks Server, see "Backing Up and Restoring the ZENworks Server and Certificate Authority" in the *ZENworks Disaster Recovery Reference*.

Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server

1. Store the ZENworks administrator name and password by entering the following command at the command prompt:

   ```
   zman admin-store-credential administrator
   ```

   If you do not store the credentials, you must enter the ZENworks administrator name and password for each zman command.

2. You can immediately back up the embedded Sybase SQL Anywhere database or schedule the backup to run at a specific time. To back up the embedded Sybase SQL Anywhere database immediately, continue with this step. To schedule the backup to run at a specific time, skip to Step 3.

   To immediately back up the embedded Sybase SQL Anywhere database to a directory on the database server by using the zman command line utility, enter the following command at the database server console prompt:

   ```
   zman database-backup
   complete_path_of_the_backup_directory_on_database_server
   ```

For example, to back up the database to the `c:\dbbackup` directory on a Windows database server, execute `zman database-backup c:\dbbackup`. To back up the database to the `/root/dbBackup` directory on a Linux database server, execute `zman database-backup /root/dbBackup`.

To manually back up the embedded Sybase SQL Anywhere database to a directory on the database server:

2a Stop the ZENworks services on all other ZENworks Servers in the Management Zone.

- **On Windows:**
  1. Execute the following command at the server prompt:

     ```
     novell-zenworks-configure -c Start
     ```

  2. Enter the number next to the `Stop` action.
- **On Linux:**
  1. Execute the following command at the server prompt:

     ```
     /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
     ```

  2. Enter the number next to the `Stop` action.

2b Manually copy `zenworks_zone_name.db`, zen_audit_zone_name.db, `zenworks_zone_name.log`, and `zen_audit_zone_name.log` from the database server to the new location where you want to back up the database.

By default, the files are located in *`ZENworks_Installation_directory`*`\Novell\Zenworks\Database` on a Windows Sybase database server, and in `/var/opt/novell/zenworks/database/` on a Linux Sybase database server.

2c Start the ZENworks services on all other ZENworks Servers in the Management Zone.

- **On Windows:**
  1. Execute the following command at the server prompt:

     ```
     novell-zenworks-configure -c Start
     ```

  2. Enter the number next to the `Start` action.
- **On Linux:**
  1. Execute the following command at the server prompt:

     ```
     /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
     ```

  2. Enter the number next to the `Start` action.

3 (Conditional) To schedule the backup to run at a specific time every day or on specific days of a month, you need to create a schedule file and run it.

3a Create a schedule file with the Create event, `backupschedule.sql`, with the following contents:

```
CREATE EVENT backup_schedule_name

SCHEDULE

specify_the_schedule
```

A sample schedule file to back up the database at a 11 P.M. everyday is as follows:

```
CREATE EVENT ZENDBBackup
```

```
SCHEDULE

START TIME '11:00 PM'

EVERY 24 HOURS
```

A sample schedule file to back up the database at 1:00 a.m. on the first, second, third, and fourth day of the month is as follows:

```
CREATE EVENT ZENDBBackup1

SCHEDULE

START TIME '1:00 AM'

ON (1,2,3,4)
```

Sample schedule files are available in the `ZENworks_Installation_directory:\Novell\Zenworks\share\zman\samples\database` directory on a Windows server, and in the `/opt/novell/zenworks/share/zman/samples/database` directory on a Linux server.

3b Enter the following command at the command prompt:

```
zman database-backup complete_path_of_the_backup_directory
complete_path_of_backUpSchedule.sql -d SQL_function_call
```

For example, to back up the database to the `c:\dbbackup\day_of_the_week` directory on a Windows server as per the schedule in the `c:\backupschedule.sql` file, enter the following command:

```
zman database-backup c:\dbbackup c:\backUpSchedule.sql -d
"DAYNAME(now())"
```

For more information about this command, view the zman man page (man zman) on the device, or see zman(1) in the *ZENworks Command Line Utilities Reference*.

4 Clear the credentials stored in Step 1 by entering the following command at the command prompt:

```
zman admin-clear-credential
```

According to the backup schedule, the `zenworks_zone_name.db` database file and the `zenworks_zone_name.log` transaction log file are created in the database backup directory.

If you want to change the database backup location or the backup schedule at a later time, review the following sections:

- "Changing the Backup Location of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup" on page 132
- "Changing the Backup Schedule of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup" on page 133

Backing up the Embedded Sybase SQL Anywhere Database Running on a Windows Server to a Network Location on a Remote Windows Machine

To back up an embedded Sybase SQL Anywhere database that is installed and running on a Windows server to a network location on another Windows machine, you need a local machine and a remote machine. The local machine is a Windows server with the ZENworks server components and the embedded Sybase SQL Anywhere database installed. The remote machine is a Windows machine that has the network location to which you want to back up the database.

1. Perform the following steps on the local machine:
   - **1a** Create an administrative user and specify a password.

     For example, you could specify the administrative username as `Administrator` and the password as `novell`.
   - **1b** From the desktop **Start** menu, click **Settings**, click **Control Panel**, double-click **Administrative Tools**, then double-click **Services**.
   - **1c** Right-click the **Novell ZENworks Datastore** service, then click **Properties**.
   - **1d** Click the **Log On** tab.
   - **1e** Select **This account**, then specify the name and the password of the administrative user created in Step 1a.

     For example, specify the user as `Administrator` and the password as `novell`.
   - **1f** Click **OK**.
2. Perform the following steps on the remote machine that has the network location where you want to save the backup:
   - **2a** Create an account with the same credentials as the user you created in Step 1a.

     For example, specify user as `Administrator` and password as `novell`.
   - **2b** Provide Read/Write permission on the network location to the user.
3. You can immediately back up the embedded Sybase SQL Anywhere database or schedule the backup to run at a specific time. To immediately back up the database, continue with this step. To schedule the backup to run at a specific time every day or on specific days of a month, skip to Step 4.

   To immediately back up the database to the network location on the remote machine by using the zman command line utility, enter the following command at the database server console prompt:

   ```
   zman database-backup
   \\IP_address_of_the_remote_machine\backup_directory\custom_directory
   ```

   Where `\\IP_address_of_the_remote_machine\backup_directory` is the network location on the remote machine and *`custom_directory_name`* is a name that you specify for a directory to be newly created by zman and into which the database files are to be backed up.

   To manually back up the database to the network location on the remote machine:

   - **3a** Stop the ZENworks services on all the ZENworks Servers in the Management Zone.
     - **3a1** Execute the following command at the server prompt:

```
novell-zenworks-configure -c Start
```

3a2 Enter the number next to the `Stop` action.

3b Manually copy `zenworks_zone_name.db` and `zenworks_zone_name.log` from the database server to a required location on the remote machine.

By default, the files are located in *`ZENworks_Installation_directory`*`\Novell\Zenworks\Database` on a Windows Sybase database server.

3c Start the ZENworks services on all the ZENworks Servers in the Management Zone.

3c1 Execute the following command at the server prompt:

```
novell-zenworks-configure -c Start
```

3c2 Enter the number next to the `Start` action.

4 (Conditional) To schedule the backup:

4a Create a schedule file, `backupschedule.sql`, with the following contents:

```
CREATE EVENT backup_schedule_name

SCHEDULE

specify_the_schedule
```

A sample schedule file to back up the database at a 11 p.m. every day is as follows:

```
CREATE EVENT ZENDBBackup

SCHEDULE

START TIME '11:00 PM'

EVERY 24 HOURS
```

A sample schedule file to back up the database at 1:00 a.m on the first, second, third, and fourth day of the month is as follows:

```
CREATE EVENT ZENDBBackup1

SCHEDULE

START TIME '1:00 AM'

ON (1,2,3,4)
```

Sample schedule files are available in the *`ZENworks_Installation_directory`*`\Novell\Zenworks\share\zman\samples\database` directory.

4b Execute the following command at the command prompt:

```
zman database-backup
\\IP_address_of_the_remote_machine\backup_directory\custom_director
y c:\backUpSchedule.sql -d SQL_function_call
```

Where `\\IP_address_of_the_remote_machine\backup_directory` is the network location on the remote machine and `custom_directory_name` is a name that you specify for a directory to be newly created by zman and into which the database files are to be backed up.

For more information about the command, view the zman man page (man zman) on the device, or see zman(1) in the *ZENworks Command Line Utilities Reference*.

According to the backup schedule, `zenworks_zone_name.db` and `zenworks_zone_name.log` are created in the network location on the remote machine. The backed-up database is stored in `zenworks_zone_name.db`. The result of the database backup is logged in `zenworks_zone_name.log`.

If you want to change the database backup location or the backup schedule at a later time, review the following sections:

- "Changing the Backup Location of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup" on page 132
- "Changing the Backup Schedule of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup" on page 133

Backing up the Embedded Sybase SQL Anywhere Database Running on a Linux Server to a Network Location on a Remote Linux Machine

To back up the embedded Sybase SQL Anywhere database that is installed and running on a Linux server to a network location on a Linux machine, you need a local machine and a remote machine. The local machine is a Linux server with the ZENworks server components and the embedded Sybase SQL Anywhere database installed. The remote machine is a Linux machine that has the network location to which you want to back up the database.

You can back up the database on a Linux machine by using any Linux share such as Samba share or NFS share.

To back up the embedded Sybase SQL Anywhere database that is installed and running on a Linux server to a network location on a Linux machine by using Samba share:

1. Create a Samba share on the remote machine:
   - **1a** Create a user by entering the `useradd user_name` command at the command prompt.
   - **1b** Log into the remote machine with the username created in Step 1a, and set the password by using the `passwd specify_the_password` command.
   - **1c** Create a directory to save the database backup.

     For example, create a directory with the name `backup`.
   - **1d** Open the Samba server settings by running the `yast2 samba-server` command.
   - **1e** Click the **Shares** tab, then click **Add** to specify the share name and the path to the backup directory created in Step 1c.

     For example, specify the sharename as `dbbackup`.

1f Select the dbbackup share, click **Edit**, then add the following attributes:

- create mask = 0640
- force user = *user_name_created_in_*Step 1a
- guest ok = yes
- public = yes
- wide links = no
- writeable = yes

2 Create a directory on the local machine.

For example, create a directory with the name `zenworks_dbbackup` in `/root`.

3 Mount the Samba share on the `zenworks_dbbackup` directory on the local machine by entering the following command at the command prompt:

```
mount -t smbfs //IP_address of the remote_machine/share_name -o
username=user_name_specified_in_Step1a,password=password_
specified_in_Step_1b
local_directory_name_with_complete_path_created_in_Step2
```

For example:

```
mount -t smbfs //IP_address of the remote_machine/dbbackup -o
username=user_name_specified_in_Step1a,password=password_
specified_in_Step_1b /root/zenworks_dbbackup
```

4 You can immediately back up the database or schedule the backup to run at a specific time.To immediately back up the database, continue with this step. To schedule the backup to run at a specific time every day or on specific days of a month, skip to Step 5.

To immediately back up the database to the network location on the remote machine by using the zman command line utility, enter the following command at the database server console prompt:

```
zman database-backup database_backup_directory
```

For example:

```
zman database-backup /root/zenworks_dbbackup
```

To manually back up the database to the network location on the remote machine:

4a Stop all the ZENworks services on the all the ZENworks Servers in the Management Zone.

4a1 Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

4a2 Enter the number next to the `Stop` action.

4b Manually copy `zenworks_zone_name.db` and `zenworks_zone_name.log` from the database server to a required location on the remote machine.

By default, the files are located in `/var/opt/novell/zenworks/database/` on a Linux Sybase database server.

4c Start all the ZENworks services on the all the ZENworks Servers in the Management Zone.

4c1 Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

4c2 Enter the number next to the `Start` action.

5 (Conditional) To schedule the backup:

5a Create a schedule file, `backupschedule.sql`, with the following contents:

```
CREATE EVENT backup_schedule_name
SCHEDULE
specify_the_schedule
```

A sample schedule file to back up the database at a 11 p.m. everyday is as follows:

```
CREATE EVENT ZENDBBackup
SCHEDULE
START TIME '11:00 PM'
EVERY 24 HOURS
```

A sample schedule file to back up the database at 1:00 a.m. on the first, second, third, and fourth days of the month is as follows:

```
CREATE EVENT ZENDBBackup1
SCHEDULE
START TIME '1:00 AM'
ON (1,2,3,4)
```

Sample schedule files are available in the `ZENworks_Installation_directory:\Novell\Zenworks\share\zman\samples\database` directory.

5b Enter the following command at the command prompt:

```
zman database-backup database_backup_directory
c:\backUpSchedule.sql -d SQL_function_call
```

For example:

```
zman database-backup /root/zenworks_dbbackup c:\backUpSchedule.sql
-d SQL_function_call
```

For more information about this command, view the zman man page (man zman) on the device, or see zman(1) in the *ZENworks Command Line Utilities Reference*.

According to the backup schedule, `zenworks_zone_name.db` and `zenworks_zone_name.log` are created in the network location on the remote machine (`/root/zenworks_dbbackup`). The backed-up database is stored in `zenworks_zone_name.db`. The result of the database backup is logged in `zenworks_zone_name.log`.

If you want to change the database backup location or the backup schedule at a later time, review the following sections:

- "Changing the Backup Location of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup" on page 132
- "Changing the Backup Schedule of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup" on page 133

4 Restoring the Embedded Sybase SQL Anywhere Database

The following sections provide information on restoring the backed-up embedded Sybase SQL Anywhere database:

- "Restoring the Embedded Sybase SQL Anywhere Database on a Windows Server" on page 23
- "Restoring the Embedded Sybase SQL Anywhere Database on a Linux Server" on page 25
- "Restoring the Embedded Sybase SQL Anywhere Database on the ZENworks Appliance Server" on page 26

IMPORTANT

If the database is located on a ZENworks Server, you must first restore the ZENworks Server, then restore the ZENworks database. Ensure that you have backed up the ZENworks Server and the database (at least once). You can also back up the ZENworks database on a regular basis. However, you can back up the server and the database in any order.

For more information about backing up and restoring the ZENworks Server, see "Backing Up and Restoring the ZENworks Server and Certificate Authority" in the *ZENworks Disaster Recovery Reference*.

Restoring the Embedded Sybase SQL Anywhere Database on a Windows Server

1. Stop the ZENworks services on all the ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.
2. At the Windows server prompt, go to *ZENworks_Installation_directory:*`\novell\zenworks\bin`, and enter the following command:

   ```
   ZenworksWindowsDBRestore.bat
   ZENworks_Installation_directory:\Novell\Zenworks\Database
   c:\dbBackup\zenworks_zone_name.db c:\dbBackup\zenworks_zone_name.log
   ```

   NOTE: For the Audit database, go to *ZENworks_Installation_directory:*`\novell\zenworks\bin`, and enter the following command:

   ```
   ZenworksWindowsDBRestore.bat
   ZENworks_Installation_directory:\Novell\Zenworks\Database
   c:\dbBackup\zenworks_zone_name.db c:\dbBackup\zen_audit_zone_name.log
   ```

3. Press any key when the following message is displayed:

```
Before proceeding, ensure  that you have backed up any files
in:<Installation directory>:\Novell\ZENworks\database Press any key to
continue.
```

4 Enter Y when the following message is displayed:

```
The following services are dependent on the Novell ZENworks Datastore
service. Stopping the Novell ZENworks Datastore service will also stop
these services: Novell ZENworks Loader, Novell ZENworks Agent Service,
Novell ZENworks Server. Do you want to continue this operation? (Y/N)
[N]:
```

5 Press any key when the following message is displayed:

```
The Novell ZENworks Datastore service was stopped successfully. Press
any key to continue.
```

6 Enter `Yes` when the following message is displayed:

```
Overwrite <installation
directory>:\Novell\ZENworks\database\zenworks_<zone_name>.db? (Yes/No/
All)
```

7 Enter `Yes` when the following message is displayed:

```
Overwrite <installation
directory>:\Novell\ZENworks\database\zenworks_<zone_name>.log? (Yes/No/
All):
```

The `backupFile` and the `backupLogFile` are copied to *`ZENworks_Installation_directory`*`:\Novell\ZENworks\database`, and the database is restored.

8 Run `ZenworksWindowsDBRestore.bat` for restoring Audit Database.

```
ZenworksWindowsDBRestore.bat
ZsENworks_Installation_directory:\Novell\Zenworks\Database
c:\dbBackup\zen_audit_zone_name.db c:\dbBackup\zen_audit_zone_name.log
```

9 Press any key when the following message is displayed: `Before proceeding, ensure that you have backed up any files in:<Installation directory>:\Novell\ZENworks\database Press any key to continue`.

10 Press any key when the following message is displayed: **The Novell ZENworks Embedded Datastore service is stopping.**

- `The Novell ZENworks Embedded Datastore service is stopping.`
- `The Novell ZENworks Embedded Datastore service was stopped successfully.`
- `Press any key to continue.`

11 Enter `Yes` when the following message is displayed: `Overwrite <installation directory>:\Novell\ZENworks\database\zen_audit_<zone_name>.db? (Yes/No/All)`

12 Enter `Yes` when the following message is displayed: `Overwrite <installation directory>:\Novell\ZENworks\database\zen_audit_<zone_name>.log? (Yes/No/All)`

The `backupFile` and the `backupLogFile` are copied to `ZENworks_Installation_directory:\Novell\ZENworks\database`, and the database is restored.

13 (Conditional) If you restore the database to a location other than the one mentioned in the *`zenworks_installation_directory`*`\novell\zenworks\database\conf\zenworks_database.conf` and `zenworks_audit_database.conf` files to specify the new location of the database.

14 Start all the ZENworks services on all the ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

Restoring the Embedded Sybase SQL Anywhere Database on a Linux Server

1 Stop the ZENworks services on other ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

2 Log into the ZENworks server as `root`.

3 Change to `/opt/novell/zenworks/bin`, and enter the following command:

```
./ZenworksLinuxDBRestore.sh -F "/root/dbBackup/zenworks_zone_name.db"
```

NOTE: For the Audit database, change to `/opt/novell/zenworks/bin`, and enter the following command:

```
./ZenworksLinuxDBRestore.sh -F "/root/dbBackup/zen_audit_zone_name.db"
```

---

4 Enter Y when the following message is displayed:

```
The backup database file will OVERWRITE the existing database. Is that
OK? [y/n]
```

5 Enter Y when the following message is displayed:

```
The novell-zenmntr needs to be stopped for the database restore to be
performed. Would you like to proceed [y/n]?
```

6 Enter Y when the following message is displayed:

```
The novell-zenserver needs to be stopped for the database restore to be
performed. Would you like to proceed [y/n]?
```

7 Enter Y when the following message is displayed:

```
The novell-zenloader needs to be stopped for the database restore to be
performed. Would you like to proceed [y/n]?
```

The backup file is copied to `/var/opt/novell/zenworks/database`, and the restore log file to `/var/opt/novell/log/zenworks/dbrestore.log`. The database is restored.

8 Start the ZENworks services on other ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

Restoring the Embedded Sybase SQL Anywhere Database on the ZENworks Appliance Server

1. Ensure that you have archived your database credentials.

   To archive the credentials of an internal Sybase database, perform the following tasks on PSDB1:

   1a. Ensure that the database services are running.

   On Windows: In the Windows Services, ensure that the status of **Novell ZENworks Embedded Datastore** and **Novell ZENworks Embedded Datastore For Auditing** are *Started*.

   On Linux: At the console prompt, enter `/etc/init.d/sybase-asa status` to verify the status of the Sybase database and `/etc/init.d/sybase-audit-asa status` to verify the status of the Audit database. If the databases are not running, start the Sybase database by running the `/etc/init.d/sybase-asa start` command and the Audit database by running the `/etc/init.d/sybase-audit-asa start` command.

   1b. Execute the `zman dgc` command to get the Sybase database credentials.

   1c. Execute the `zman dgca` command to get the Audit database credentials.

   1d. Specify the credentials of the ZENworks administrator when prompted.

   1e. Copy and save the username and the password of the Sybase database and the Audit database into a text file.

2. Stop the Novell ZENworks services, including the ZENworks Embedded Datastore service and the Novell ZENworks Embedded Datastore For Auditing service on PSDB1:

   2a. **On Windows:**

   2a1. Execute the following command at the server prompt:

   ```
   novell-zenworks-configure -c Start
   ```

   2a2. Specify the number next to the `Stop` action, then press **Enter**.

   2b. **On Linux:**

   2b1. Execute the following command at the server prompt:

   ```
   /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
   ```

   2b2. Specify the number next to the `Stop` action, then press **Enter**.

3. Stop the Novell ZENworks services on PSDB2:

   3a. Execute the following command at the server prompt:

   ```
   /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
   ```

   3b. Specify the number next to the `Stop` action, then press **Enter**.

4 Get the following files on PSDB2:

- `sybase-asa-12.0.1-3873.x86_64.rpm`
- `novell-zenworks-sybase-libs-12.0.1-3873.x86_64.rpm`

4a Create a temporary directory named `sybase` in `/tmp/` folder.

4b Copy the following files from PSDB1 to the temporary location that you created on PSDB2 (Step 4a on page 27).

- **For Windows:**
  - `sybase-asa-12.0.1.3924.x86_64.msi`
  - `novell-zenworks-sybase-libs-12.0.1.3924.x86_64.msi`

  If PSDB1 is a Windows server:

  - The MSIs are located in the following directory: *%ZENWORKS_HOME%*`\install\downloads\msi`
  - The RPMs are located in the following directory: *%ZENWORKS_HOME%*`\install\downloads\rpm`

- **For Linux:**
  - `sybase-asa-12.0.1-3873.x86_64.rpm`
  - `novell-zenworks-sybase-libs-12.0.1-3873.x86_64.rpm`

  If PSDB1 is a Linux server:

  - The MSIs are located in the following directory:

    `\opt\novell\zenworks\install\downloads\msi\`
  - The RPMs are located in the following directory:

    `\opt\novell\zenworks\install\downloads\rpm`

Or

Download the required Sybase SQL Anywhere Embedded EBF package to the temporary location that you created on PSDB2 (Step 4a on page 27).

- **For Windows:** Launch the shipped ISO file and extract the contents in the media drive. Download the Sybase SQL Anywhere Embedded EBF 3924 package from the MSI folder as shown below:

  `D:\Zenworks11SP4\Common\msi\sybase-asa-12.0.1.3924.x86_64.msi`

- **For Appliance:** Mount the shipped ISO file to any location (for example: `/tmp`) using the following command:

  ```
  mount Zenworks11SP4 -o loop/tmp/ZCM
  ```

  From the media root (for example: `/tmp/ZCM`), download the Sybase SQL Anywhere Embedded EBF 3873 package from the rpm folder as shown below:

  `/tmp/ZCM/Common/rpm/sybase-asa-12.0.1-3873.x86_64.rpm`

5 On PSDB2, install `sybase-asa-12.0.1.3924.x86_64.msi` or `sybase-asa-12.0.1-3873.x86_64.rpm`.

On an Appliance server: At the server prompt, execute the following command:

```
rpm -Uvh <complete_path_of_directory_that_contains_Sybase_ASA_MSI>/
sybase-asa-12.0.1-3873.x86_64.rpm
```

For example:

```
rpm -Uvh /tmp/sybase/sybase-asa-12.0.1-3873.x86_64.rpm
```

The Sybase database is now installed on PSDB2.

6 On PSDB2, ensure that the installed EBF version is 12.0.1.3924 by running the `dblocate` utility.

The `dblocate` utility is located in the `%ZENWORKS_HOME%\share\ASA\BIN64` directory on a Windows database server and in the `/opt/novell/zenworks/share/sybase/bin32s` directory on a Linux database server.

7 On PSDB2, install `novell-zenworks-sybase-libs-12.0.1.3924.x86_64.msi` or `novell-zenworks-sybase-libs-12.0.1-3873.x86_64.rpm`.

On an Appliance server: At the server prompt, execute the following command:

```
rpm -Uvh <complete_path_of_directory_that_contains_Sybase-libs_MSI>/
novell-zenworks-sybase-libs-12.0.1-3873.x86_64.rpm --force
```

For example:

```
rpm -Uvh /tmp/sybase/novell-zenworks-sybase-libs-12.0.1-3873.x86_64.rpm
--force
```

8 Change the password of the *zenworks* user account by using the following command:

```
passwd zenworks
```

9 Copy the database files from PSDB1 to PSDB2:

9a Create a directory with the name `database` in `/var/opt/novell/zenworks/` on an Appliance PSDB2.

9b Copy all the files from *%ZENWORKS_HOME%*`\database\` on Windows PSDB1 to *%ZENWORKS_HOME%*`\database\` on Appliance PSDB2, and from `/var/opt/novell/zenworks/database/` on Linux PSDB1 to `/var/opt/novell/zenworks/database/` on Appliance PSDB2.

10 Copy the `zenworks_database.conf` file and the `zenworks_audit_database.conf` file from PSDB1 to PSDB2. The `zenworks_database.conf` file and the `zenworks_audit_database.conf` file are located in the *%ZENWORKS_HOME%*`\conf\` directory on a Windows Primary Server, and in the `/etc/opt/novell/zenworks/` directory on a Linux Primary Server.

11 On PSDB2, ensure that `zenworks_database.conf` and `zenworks_audit_database.conf` contain the correct database path.

For example, `/var/opt/novell/zenworks/database/zenworks_`*zone_name*`.db` is the database path on a Linux device.

12 On all the Primary Servers in the Management Zone, update `zdm.xml` with the correct address of PSDB2 (the new database server). The `zdm.xml` file is located in *ZENworks_installation_path*`\conf\datamodel` on a Windows Primary Server, and in `/etc/opt/novell/zenworks/datamodel` on a Linux Primary Server.

13 On the PSDB2 linux server, run the `permission.sh` command in the `/opt/novell/zenworks/bin` directory.

14 Reboot the PSDB2 server.

15 Start all the ZENworks Services except Novell ZENworks Embedded Datastore and Novell ZENworks Embedded Datastore For Auditing on PSDB1:

15a **On Windows:** Perform the following steps:

15a1 Execute the following command at the server prompt:

```
novell-zenworks-configure -c Start
```

15a2 Specify the number next to the `Start` action, then press **Enter**.

15b **On Linux:** Perform the following steps:

15b1 Execute the following command at the server prompt:

/opt/novell/zenworks/bin/novell-zenworks-configure -c Start

15b2 Specify the number next to the `Start` action, then press **Enter**.

16 Assign the database role to PSDB2 by running the following command in the DBISQL utility:

```
update zZenServerRoles set id=<0xNew DB servers GUID>, position=(select
max(position) from zZENServerRoles where id=<0xNew DB servers GUID>)+1
where Roles='Database'
```

5 Moving the Data from an Embedded Sybase Database to an External Sybase Database

ZENworks allows you move the data from a Sybase SQL Anywhere database (embedded Sybase database) to an OEM Sybase database (external Sybase database).

- "Preparing to Move the Data" on page 31
- "Moving the Data from the Internal Sybase to the External Sybase" on page 31

Preparing to Move the Data

Before moving the data from an internal Sybase database to an external Sybase database, perform the following:

- Ensure that ZENworks is installed with an internal Sybase database on a Windows or Linux device.
- Install the external Sybase database. For more information on how to install an external Sybase database, for Windows, see "Installing an External ZENworks Database" for Linux, see "Installing an External ZENworks Database"in the *ZENworks Server Installation Guide*.

Moving the Data from the Internal Sybase to the External Sybase

1. On the device that has the external Sybase database installed, stop the Novell ZENworks Embedded Datastore service.
   - **On Windows:**
     1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
     2. Double-click **Administrative Tools** > **Services**.
     3. Right-click the **Novell ZENworks Embedded Datastore** service, then click **Stop**, or select the **Novell ZENworks Embedded Datastore** service, then click ■ on the toolbar.
   - **On Linux:** At the console prompt, enter
     - `/etc/init.d/sybase-asa stop` on SLES 11
     - `systemctl stop sybase-asa.service` on SLES 12
2. On the device that has the external Sybase database installed, stop the Novell ZENworks Embedded Datastore for auditing service.
   - **On Windows:**
     1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.

2. Double-click **Administrative Tools** > **Services**.
3. Right-click the **Novell ZENworks Embedded Datastore For Audit** service, then click **Stop**, or select the **Novell ZENworks Embedded Datastore For Audit** service, then click on the toolbar.

- **On Linux:** At the console prompt, enter
  - `/etc/init.d/sybase-audit-asa stop` on SLES 11
  - `systemctl stop sybase-audit-asa.service` on SLES 12

3 Stop the ZENworks services on all the ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

4 From the device that has the internal Sybase database installed, copy `zenworks_database.conf` and all files within the `database` directory to the appropriate directories on the device that has the external Sybase database.

The `zenworks_database.conf` is located in the *`ZENworks_installation_path`*`\conf\` directory on Windows and in the `/etc/opt/novell/zenworks/` directory on Linux.

The `database` directory is located in *`ZENworks_installation_path`* on Windows and in the `/var/opt/novell/zenworks/` directory on Linux.

5 On the device that has the external Sybase database installed, open `zenworks_database.conf` and ensure that it contains the correct path of the database file.

6 On the device that has the internal Sybase database installed, edit `zdm.xml` and `zenaudit.xml` (located in *`ZENworks_installation_path`*`\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux):

- Change the value of the Embedded entry key to `false`. By default, it is `true`.
- Set the value of the `Server` entry key to the IP address of the device that has the external Sybase database installed.
- ensure that the value of the `Port` entry key is the port number on which the external Sybase database is running.

7 On the device that has the external Sybase database installed, start the Novell ZENworks Embedded Datastore service.

- **On Windows:**
  1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
  2. Double-click **Administrative Tools** > **Services**.
  3. Right-click the **Novell ZENworks Embedded Datastore** service, then click **Start**, or select the **Novell ZENworks Embedded Datastore** service, then click ▶ on the toolbar.
- **On Linux:** At the console prompt, enter
  - `/etc/init.d/sybase-asa start` on SLES 11
  - `systemctl start sybase-asa.service` on SLES 12

8 Delete the database role for the device that has the internal Sybase database installed by running the following command in the DBISQL utility on the external database server:

```
delete from zZenServerRoles where Roles = 'Database';
commit;
```

9 Remove the Novell ZENworks Embedded Datastore service from the device that has the internal Sybase database installed:

On the Windows device: Perform the following tasks:

1. At the server prompt, execute the following command:

   `sc delete SQLANYs_ZENDatastore`

2. Edit the`%ZENWORKS_HOME%\conf\monitor.conf` to remove `dbsrv10` from the line `highpriority=zenserver,casaserver,dbsrv10`.

On the Linux device: Perform the following tasks:

1. Stop the Novell ZENworks Embedded Datastore service by executing the following command at the console prompt:
   - `/etc/init.d/sybase-asa stop` on SLES 11
   - `systemctl stop sybase-asa.service` on SLES 12
2. Perform any of the following:
   - On SLES 11:
     1. Rename sybase-asa to sybase-asa1 by executing the following command:

        `mv sybase-asa sybase-asa1`

     2. Edit the `/etc/opt/novell/zenworks/monitor.conf` to remove `sybase-asa` from the line `services=novell-zenserver novell-zenload sybase-asa`.
   - On SLES 12:

     Rename `sybase-asa.service` to `sybase-asa.service1` in the `/usr/lib/systemd/system` folder.

10 Start all the ZENworks services on all the ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

The ZENworks Server now points to new database.

6 Moving the Internal Sybase Database from One Primary Server to Another Primary Server

Assume that the Primary Server that currently hosts the internal Sybase database is called PSDB1. Assume that the Primary Server or the new device to which you want to move the internal Sybase database is called PSDB2.

1. Ensure that you have archived your database credentials.

   To archive the credentials of an internal Sybase database, perform the following tasks on PSDB1:

   1a. Ensure that the database services are running.

   On Windows: In the Windows Services, ensure that the status of **Novell ZENworks Embedded Datastore** and **Novell ZENworks Embedded Datastore For Auditing** are *Started*.

   On Linux: At the console prompt,

   Enter `/etc/init.d/sybase-asa status` on SLES 11 or `systemctl status sybase-asa.service` on SLES 12 to verify the status of the Sybase database.

   Enter `/etc/init.d/sybase-audit-asa status` on SLES 11 or `systemctl status sybase-audit-asa.service` on SLES 12 to verify the status of the Audit database.

   If the databases are not running, start the

   Sybase database by running the:

   - `/etc/init.d/sybase-asa start` on SLES 11.
   - `systemctl start sybase-asa.service` on SLES 12.

   Audit database by running:

   - `/etc/init.d/sybase-audit-asa start` on SLES 11.
   - `systemctl status sybase-audit-asa.service` on SLES 12.

   1b. Obtain the Sybase database credentials by running the `zman dgc` command.

   1c. Obtain the Audit database credentials by running the `zman dgca` command.

   1d. Provide the credentials of the ZENworks administrator when prompted.

   1e. Copy and save the user name and the password of the Sybase database and the Audit database into a text file.

2. Stop the Novell ZENworks services, including the ZENworks Embedded Datastore service and the Novell ZENworks Embedded Datastore For Auditing service on PSDB1:

   2a. **On Windows:** Perform the following steps:

   2a1. Execute the following command at the server prompt:

   ```
   novell-zenworks-configure -c Start
   ```

   2a2. Specify the number next to the `Stop` action, then press **Enter**.

2b **On Linux:** Perform the following steps:

2b1 Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

2b2 Specify the number next to the `Stop` action, then press **Enter**.

3 Stop the Novell ZENworks services on PSDB2:

3a **On Windows:** Perform the following steps:

3a1 Execute the following command at the server prompt:

```
novell-zenworks-configure -c Start
```

3a2 Specify the number next to the `Stop` action, then press **Enter**.

3b **On Linux:** Perform the following steps:

3b1 Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

3b2 Specify the number next to the `Stop` action, then press **Enter**.

4 Procure the following files on PSDB2 based on your operating system:

For Windows:

- `sybase-asa-17.0.0.26419.x86_64.msi`
- `novell-zenworks-sybase-libs-17.0.0.26419.x86_64.msi`

For Linux:

- `sybase-asa-17.0.0-26387.x86_64.rpm`
- `novell-zenworks-sybase-libs-17.0.0-26387.x86_64.rpm`

4a Create a temporary directory named `sybase` in `c:` if PSDB2 is a Windows device, and in `/tmp/` if PSDB2 is a Linux device.

4b Copy the following files from PSDB1 to the temporary location that you created on PSDB2 (Step 4a on page 36).

- **For Windows:**
  - `sybase-asa-17.0.0.26419.x86_64.msi`
  - `novell-zenworks-sybase-libs-17.0.0.26419.x86_64.msi`

  If PSDB1 is a Windows server:
  - The MSIs are located in the following directory: *%ZENWORKS_HOME%*`\install\downloads\msi`
  - The RPMs are located in the following directory: *%ZENWORKS_HOME%*`\install\downloads\rpm`
- **For Linux:**
  - `sybase-asa-17.0.0-26387.x86_64.rpm`
  - `novell-zenworks-sybase-libs-17.0.0-26387.x86_64.rpm`

  If PSDB1 is a Linux server:
  - The MSIs are located in the following directory:

    `\opt\novell\zenworks\install\downloads\msi\`

- The RPMs are located in the following directory:

  `\opt\novell\zenworks\install\downloads\rpm`

Or

Download the required Sybase SQL Anywhere Embedded EBF package to the temporary location that you created on PSDB2 (Step 4a on page 36).

- **For Windows:** Launch the shipped ISO file and extract the contents in the media drive. Download the Sybase SQL Anywhere Embedded EBF 3924 package from the msi folder as shown below:

  `D:\Zenworks11SP4\Common\msi\sybase-asa-17.0.0.26419.x86_64.msi`

- **For Linux:** Mount the shipped ISO file to any location (for example: `/tmp`) using the following command:

  ```
  mount Zenworks11SP4 -o loop/tmp/ZCM
  ```

  From the media root (for example: `/tmp/ZCM`), download the Sybase SQL Anywhere Embedded EBF 3873 package from the rpm folder as shown below:

  `/tmp/ZCM/Common/rpm/sybase-asa-17.0.0-26387.x86_64.rpm`

5 On PSDB2, install `sybase-asa-17.0.0.26419.x86_64.msi` or `sybase-asa-17.0.0-26387.x86_64.rpm`.

- **On a Windows server:** At the server prompt, execute the following command:

  ```
  msiexec /i
  <complete_path_of_directory_that_contains_Sybase_ASA_MSI>\sybase-
  asa-17.0.0.26419.x86_64.msi TARGETDIR="%ZENWORKS_HOME%\share"
  ALLUSERS=2
  ```

  For example:

  ```
  msiexec /i c:\sybase-asa-17.0.0.26419.x86_64.msi
  TARGETDIR="%ZENWORKS_HOME%\share" ALLUSERS=2
  ```

- **On a Linux server:** At the server prompt, execute the following command:

  ```
  rpm -Uvh <complete_path_of_directory_that_contains_Sybase_ASA_MSI>/
  sybase-asa-17.0.0-26387.x86_64.rpm --force
  ```

  For example:

  ```
  rpm -Uvh /tmp/sybase/sybase-asa-17.0.0-26387.x86_64.rpm --force
  ```

The Sybase database is now installed on PSDB2.

6 On PSDB2, ensure that the installed EBF version is 17.0.0.26419 or higher by running the `dblocate` utility.

The `dblocate` utility is located in the `%ZENWORKS_HOME%\share\ASA\BIN64` directory on a Windows database server and in the `/opt/novell/zenworks/share/sybase/bin32s` directory on a Linux database server.

7 On PSDB2, install `novell-zenworks-sybase-libs-17.0.0.26419.x86_64.msi` or `novell-zenworks-sybase-libs-17.0.0-26387.x86_64.rpm`.

- **On a Windows server:** At the server prompt, execute the following command:

  ```
  msiexec /i <complete_path_of_directory_that_contains_Sybase-
  libs_MSI>\novell-zenworks-sybase-libs-17.0.0.26419.x86_64.msi
  TARGETDIR="{Parent of the Novell\ZENworks directory structure}"
  ```

```
ALLUSERS=2 REBOOT=ReallySuppress /l*v
<complete_path_of_directory_that_contains_Sybase-libs_MSI>\novell-
zenworks-sybase-libslog.txt
```

For example:

```
msiexec /i c:\sybase\novell-zenworks-sybase-libs-
17.0.0.26419.x86_64.msi TARGETDIR="C:\Program Files (x86)"
ALLUSERS=2 REBOOT=ReallySuppress /l*v c:\sybase\novell-zenworks-
sybase-libslog.txt
```

- **On a Linux server:** At the server prompt, execute the following command:

```
rpm -Uvh <complete_path_of_directory_that_contains_Sybase-
libs_MSI>/novell-zenworks-sybase-libs-17.0.0-26387.x86_64.rpm --
force
```

For example:

```
rpm -Uvh /tmp/sybase/novell-zenworks-sybase-libs-17.0.0-
26387.x86_64.rpm --force
```

8 (Conditional) If PSDB2 is a Windows Primary Server, import the registry keys that add the ZENworks Embedded Datastore service to PSDB2:

8a Download `embedded_datastore-edit_me_first.zip` from the Micro Focus Customer Center to a temporary location on PSDB2, then extract the contents of the ZIP file.

The ZIP file contains the `embedded_database.reg` file and the `embedded_audit_database.reg` file.

8b Open `embedded_database.reg` and `embedded_audit_database.reg` in a text editor, then make the following changes:

- Change the value of `ObjectName` to the local _z_ username that is created after you install ZENworks. By default, the value of `ObjectName` is `.\\__z_10_2__`.

  To find the local _z_ username, do one of the following:

  - At the command prompt, enter `net user|find /i "__z"`.
  - Open the Windows Computer Management, then browse to **System Tools** > **Local User and Groups** > **Users**.

  For example, if the resultant value is `__z_0_244__ Administrator ASPNET`, the local _z_ username is `__z_0_224__`. The value of `ObjectName` in `embedded_database.reg` must be changed from`__z_10_2__` to `__z_0_224__`. Ensure that the value is prepended with a period (.) and two backslashes (\\), such as `.\\__z_0_224__`

- On PSDB2, ensure that the value of `Parameters` contain the correct path of `zenworks_database.conf` in the `embedded_database.reg` file and `zenworks_audit_database.conf` in the `embedded_audit_database.reg` file.

IMPORTANT: In the value for `Parameters`, the double quote (") and the backslash \ characters must be escaped by placing a backslash in front. For example, if `zenworks_database.conf` is located in `d:\novell\zenworks\conf\`, the value of `Parameters` is `"\"@d:\\Novell\\ZENworks\\conf\\zenworks_database.conf\""`

8c Double-click the `embedded_database.reg` file and the `embedded_audit_database.reg` file.

8d When you are prompted to add the content of the `embedded_database.reg` file and `embedded_audit_database.reg` file to the registry, click **Yes**.

8e Go to `HKLM\SYSTEM\CurrentControlSet\services\SQLANYs_ZENDataStore` and verify the ImagePath value to ensure it is pointing to `dbsrv17.exe`.

For example:

```
C:\Program Files (x86)\Novell\ZENworks\share\ASA\BIN64\dbsrv17.exe
-hvSQLANYs_ZENDatastore
```

8f Go to `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\SQLANYs_ZENAuditDatastore` and verify the ImagePath value to ensure it is pointing to `dbsrv17.exe`.

For example:

```
C:\Program Files (x86)\Novell\ZENworks\share\asa\Bin64\dbsrv17.exe
-hvSQLANYs_ZENAuditDatastore
```

8g After adding the registry, restart the device.

9 If PSDB2 is a Windows Primary Server, perform either of the following options:

- **Option 1:**
  1. Change the password of the local *_z_* user account.

     For more information about how to change the password of a user account, see the Microsoft Windows documentation.
  2. Change the password of the `Novell ZENworks Embedded Datastore`, `Novell ZENworks Embedded Datastore For Auditing`, `Novell ZENworks Join Proxy`, `Novell ZENworks Loader`, `Novell ZENworks Preboot Policy Service`, `Novell ZENworks Preboot Service`, `Novell ZENworks Server`, `Novell ZENworks services Monitor`, and `CasaAuthTokenSvc` services:
     a. On **Services (Local)**, right-click the service, then select **Properties**.
     b. On the property page, click **Log On** > **This account**, then specify a **Password**.
     c. Click **Apply**, then **OK**.
- **Option 2:**

  Change the `Log On` account of the `Novell ZENworks Embedded Datastore`, and `Novell ZENworks Embedded Datastore For Auditing` services:
  1. On **Services (Local)**, right-click the service, then select **Properties**.
  2. On the property page, click **Log On** > **Local System account** > **Allow service to interact with desktop**.
  3. Click **Apply**, then **OK**.

10 Copy the database files from PSDB1 to PSDB2:

10a Create a directory with the name `database` in *%ZENWORKS_HOME%* on Windows PSDB2, and in `/var/opt/novell/zenworks/` on Linux PSDB2.

10b Copy all the files from *%ZENWORKS_HOME%*`\database\` on Windows PSDB1 to *%ZENWORKS_HOME%*`\database\` on Windows PSDB2, and from `/var/opt/novell/zenworks/database/` on Linux PSDB1 to `/var/opt/novell/zenworks/database/` on Linux PSDB2.

11 Copy the `zenworks_database.conf` file and the `zenworks_audit_database.conf` file from PSDB1 to PSDB2. The `zenworks_database.conf` file and the `zenworks_audit_database.conf` file are located in the *%ZENWORKS_HOME%*`\conf\` directory on a Windows Primary Server, and in the `/etc/opt/novell/zenworks/` directory on a Linux Primary Server.

12 On PSDB2, ensure that `zenworks_database.conf` and `zenworks_audit_database.conf` contain the correct database path.

For example, `/var/opt/novell/zenworks/database/zenworks_`*zone_name*`.db` is the database path on a Linux device.

13 On all the Primary Servers in the Management Zone, take a backup of the `zdm.xml` and `zenaudit.xml` files. Then, update the `Server` entry key (`<entry key=<"Server">`) in the `zdm.xml` and `zenaudit.xml` files with the correct address of PSDB2 (the new database server).

NOTE: If the `zdm.xml` and `zenaudit.xml` files reside within the Primary Server that contains the new database server, then it is recommended that you update the local host address `127.0.0.1` as the `Server` entry key.

These files are located in *ZENworks_installation_path*`\conf\datamodel` on a Windows Primary Server, and in `/etc/opt/novell/zenworks/datamodel` on a Linux Primary Server.

14 On the PSDB2 Linux server, run the `permissions.sh` command in the `/opt/novell/zenworks/bin` directory.

15 If PSDB1 is a Linux Primary Server:

- Remove sybase-asa sybase-audit-asa entries in /etc/opt/novell/zenworks/monitor.conf.
- Disable the Sybase database services:
  - **SLES 11:** `chkconfig sybase-asa sybase-audit-asa off`
  - **SLES 12:** `systemctl disable sybase-asa sybase-audit-asa`

16 On the PSDB2 Linux server, run the following commands:

- **On SLES 11**

  ```
  etc/int.d/sybase-asa start
  /etc/int.d/sybase-audit-asa start
  ```

- **On SLES 12**

  ```
  systemctl enable sybase-asa.service
  systemctl enable sybase-audit-asa.service
  ```

17 Reboot the PSDB2 server.

On Windows, the database services might not be displayed until the reboot is performed.

18 Start all the ZENworks services except Novell ZENworks Embedded Datastore and Novell ZENworks Embedded Datastore For Auditing on PSDB1:

18a **On Windows:** Perform the following steps:

18a1 Execute the following command at the server prompt:

```
novell-zenworks-configure -c Start
```

18a2 Specify the number next to the `Start` action, then press **Enter**.

18b **On Linux:** Perform the following steps:

18b1 Execute the following command at the server prompt:

/opt/novell/zenworks/bin/novell-zenworks-configure -c Start

18b2 Specify the number next to the `Start` action, then press **Enter**.

19 Assign the database role to PSDB2 by running the following command in the DBISQL utility:

```
update zZenServerRoles set id=<0xNew DB servers GUID>, position=(select
max(position)+1 from zZENServerRoles where id=<0xNew DB servers
GUID>)where Roles='Database'
```

7 Migrating the Data from an Internal Sybase Database to an External Oracle Database

ZENworks allows you migrate the data from an internal Sybase database running on a ZENworks Primary Server to an Oracle database installed on a device that does not have the ZENworks installed.

Review the following to migrate the database:

- "Preparing to Move the Data" on page 43
- "Migrating the Data from the Internal Sybase Database to an Oracle Database" on page 45
- "Post-Migration Tasks" on page 47

Preparing to Move the Data

Before migrating the data from the Sybase database to Oracle database, perform the following:

- Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- Ensure that the Primary Server to which the Sybase database is configured has been upgraded to ZENworks.
- Ensure that the ZENworks Primary Server has an internal Sybase database installed.
- Ensure that the Oracle database is installed on a device that does not have ZENworks installed.
- Ensure that the USERS tablespace has sufficient space to create and store the ZENworks database schema. The tablespace requires a minimum of 100 MB to create ZENworks database schema without any data in it and an appropriate additional space depending upon the size of the database to be migrated. The database migration utility uses only the USERS tablespace by default. You cannot manually specify any other tablespace during the migration.
- Ensure that the NLS_CHARACTERSET parameter is set to AL32UTF8 and the NLS_NCHAR_CHARACTERSET parameter to AL16UTF16 by running the following query at the database prompt:

  ```
  select parameter, value from nls_database_parameters where parameter
  like '%CHARACTERSET%';
  ```

- Ensure that the **sharename**, **filename**, and **path columns** do not contain blank strings in the **NC_VRBSOFTWARE** table. In case these column have blank strings, delete those records from the table. Deleting these records will remove the usage of these software from database.

  Query to delete the records from **NC_VRBSOFTWARE**:

  ```
  DELETE FROM NC_VRBSOFTWARE WHERE SHARENAME='' OR PATH='' OR FILENAME=''
  OR SHARENAME IS NULL OR PATH IS NULL OR FILENAME IS NULL;
  ```

- (Conditional) If you want to migrate the database by creating a new user schema, ensure that the following additional requirements are met:
  - You must be aware of the database administrator credentials.
  - A tablespace must already exist for associating to the Oracle access user
- You can choose to migrate the database by using an existing user schema that resides on a server in your network in the following scenarios:
  - The database administrator creates a user schema with the necessary rights and you get the credentials for that user schema from the database administrator. In this case, the database administrator credentials are not required to migrate the database.
  - You create a user schema in the Oracle database and choose to use it during the database migration.

  If you want to migrate the database by using an existing user schema, ensure that the following additional requirements are met:
  - Ensure that the user schema has the following rights to create the database.

    ```
    CREATE SESSION
    CREATE_TABLE
    CREATE_VIEW
    CREATE_PROCEDURE
    CREATE_SEQUENCE
    CREATE_TRIGGER
    ```
  - Ensure that the quota for the user schema is set to Unlimited on the USERS tablespace.
- Manually stop the ZENworks services running on all the ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

NOTE: If external Sybase database is installed by using Sybase installer instead of OEM installer from ZCM iso, then "Novell ZENworks Embeded Datastore Service" does not exists in database server. The external database service should be running before initiating the database migration.

- Ensure that the Novell ZENworks Embedded Datastore service on the Primary Server is running.
  - **On Windows:**
    1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
    2. Double-click **Administrative Tools** > **Services**.
    3. Ensure that the status of the **Novell ZENworks Embedded Datastore** service is **Started**.
  - **On Linux:** At the console prompt, enter:
    - `/etc/init.d/sybase-asa status` on SLES 11.
    - `systemctl status sybase-asa.service` on SLES 12.
- Ensure that the Novell ZENworks Embedded Datastore for auditing service on the Primary Server is running.
  - **On Windows:**
    1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.

2. Double-click **Administrative Tools** > **Services**.
3. Ensure that the status of the **Novell ZENworks Embedded Datastore For Auditing** service is **Started**.

- **On Linux:** At the console prompt, enter
  - `/etc/init.d/sybase-audit-asa status` on SLES 11.
  - `systemctl status sybase-audit-asa.service` on SLES 12.

- (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, do the following in the `novell-zenworks-configure.properties` file:

  1. Set the value of `Logger.logLevel` to the appropriate message type.

     For example, if you want messages of the type Finest to be logged:

     ```
     #Logger.logLevel   = FINEST
     ```

  2. Uncomment the line by removing the "#" as follows:

     ```
     Logger.logLevel   = FINEST
     ```

  The `novell-zenworks-configure.properties` file is located in *%ZENWORKS_HOME%*`\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

Migrating the Data from the Internal Sybase Database to an Oracle Database

- "Migrating the Data from the Internal Sybase Database to an Oracle Database" on page 45
- "Resuming the Database Migration" on page 47

Migrating the Data from the Internal Sybase Database to an Oracle Database

1. Ensure that all the tasks listed in "Preparing to Move the Data" on page 43 are completed.
2. Run the database migration utility.
   - **On the Windows Primary Server:** At the command prompt, go to *ZENworks_installation_path*`\bin\`, then enter the following command:

     ```
     novell-zenworks-configure.bat -c DBMigrateConfigureAction
     ```

   - **On the Linux Primary Server:** At the console prompt, go to `/opt/novell/zenworks/bin`, then enter the following command:

     ```
     novell-zenworks-configure -c DBMigrateConfigureAction
     ```

3. Enter the target database type as Oracle.
4. Choose the purging option for data before database migration.
5. Enter the IP address or host name of the Oracle database server.
6. Enter the port used by the Oracle database server.
7. Enter the fully qualified net service name for the Oracle database.

8 You can choose to create a new user schema or use an existing user schema.

   If you choose to create a new schema, continue with Step 9.

   If you choose to use an existing user schema, skip to Step 10.

9 Enter the database server administrator's user name and password.

10 Enter the database schema name when prompted for the database user name.

11 Enter the database schema password when prompted for the database user's password.

12 Perform the steps from Step 5 to Step 11 for ZENworks audit database. The database migration starts.

13 When the database migration is complete, you can check the `novell-zenworks-configure.log` file. The log file is located in `%ZENWORKS_HOME%\log\` on Windows and in `/var/opt/novell/log/zenworks/` on Linux.

14 Remove the Novell ZENworks Embedded Datastore service from the device that has the internal Sybase database installed:

   On the Windows device: Perform the following tasks:

   1. At the server prompt, execute the following command:

      ```
      sc delete SQLANYs_ZENDatastore
      sc delete SQLANYs_ZENAuditDatastore
      ```

   2. Edit the`%ZENWORKS_HOME%\conf\monitor.conf` to remove `dbsrv10` from the line `highpriority=zenserver,casaserver,dbsrv10`.

   On the Linux device: Perform the following tasks:

   1. At the console prompt execute the following command:
      - Sybase Database:
        - `/etc/init.d/sybase-asa stop` on SLES 11
        - `systemctl stop sybase-asa.service` on SLES 12.
      - Audit Database
        - `/etc/init.d/sybase-audit-asa stop` on SLES 11
        - `systemctl stop sybase-audit-asa.service` on SLES 12.
   2. Perform any of the following:
      - On SLES 11:
        1. Rename sybase-asa to sybase-asa1 by executing the following command:

           ```
           mv sybase-asa sybase-asa1
           ```

        2. Edit the `/etc/opt/novell/zenworks/monitor.conf` to remove `sybase-asa` from the line `services=novell-zenserver novell-zenload sybase-asa`.
      - On SLES 12:

        Rename `sybase-asa.service` to `sybase-asa.service1` in the `/usr/lib/systemd/system` folder.

15 After the database is successfully migrated, continue with the following steps:

15a Perform post-migration tasks. See "Post-Migration Tasks" on page 47.

15b Re-configure the ZENworks Reporting Server to point to the Oracle database, because it will still be pointing to the Sybase database.

Resuming the Database Migration

If the migration of the database is stopped for any reason, the ZENworks migration utility allows you to resume the migration if the `dbmigration.xml` file has been created. The file is located in the *%ZENWORKS_HOME%*`\bin` directory on Windows, and in the `/opt/ novell/zenworks/bin` directory on Linux.

1 Run the database migration utility. For more information, see Step 2 on page 45 in the "Migrating the Data from the Internal Sybase Database to an Oracle Database" on page 45.

2 Enter the target database type as Oracle.

3 Enter the IP address or host name of the Oracle database server.

   You must specify the IP address or host name of the Oracle database server used while migrating the database. For example, if you had specified the IP address of the database server while migrating the database, then you must specify the same IP address while resuming the database migration. You cannot specify the host name of the database server.

4 Enter the port used by the Oracle database server.

5 Enter the fully qualified net service name for the Oracle database.

6 Choose to use an existing schema.

7 Enter the schema name when prompted for the database user name specified before stopping the database migration.

8 Enter the database schema password when prompted for the database user's password specified before stopping the database migration.

9 Choose to resume the database migration.

   The database migration starts.

10 After the database is successfully migrated, continue with "Post-Migration Tasks" on page 47.

Post-Migration Tasks

If there is only one server in the Management Zone, all ZENworks services are automatically started after the data is successfully migrated to an Oracle database.

If there are multiple servers in the Management Zone:

1 On the device where you ran the migration utility, copy the following files to the appropriate directory on all the servers:

```
zdm.xml
dmaccounts.properties
dmmappings.properties
zenaudit.xml
zenaudit_dmaccounts.properties
```

The files are located in the *ZENworks_installation_path*\conf\datamodel directory on Windows and in the /etc/opt/novell/zenworks/datamodel directory on Linux.

Ensure that you run permissions.sh script located at /opt/novell/zenworks/bin on the Linux server after copying the above listed files.

2 Start all the ZENworks services on all the ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

The ZENworks Server now points to the new database.

For the Oracle 10g database, any administrator name is case sensitive, including login names from user sources. The default ZENworks administrator account automatically created during installation uses an initial capital, so in order to log into ZENworks Control Center, you must enter Administrator.

NOTE: Ensure not to delete the ZENworks Sybase database files if you want to revert to ZENworks Sybase database later.

---

8 Migrating the Data from an Internal Sybase Database to an MS SQL Database

ZENworks allows you migrate the data from an internal Sybase database running on a ZENworks Primary Server to an MS SQL database installed on a device that does not have the ZENworks installed.

Review the following to migrate the database:

- "Preparing to Move the Data" on page 49
- "Migrating the Data from the Internal Sybase Database to an MS SQL Database" on page 50
- "Post-Migration Tasks" on page 53

Preparing to Move the Data

Before migrating the data from the Sybase database to the MS SQL database, perform the following:

- Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- Ensure that the Primary Server to which the Sybase database is configured has been upgraded to ZENworks.
- Ensure that the ZENworks Primary Server has an internal Sybase database installed.
- Ensure that the MS SQL database is installed on a device that does not have ZENworks installed.
- (Conditional) If you want to create a new database on MS SQL Server, and migrate the Sybase data into the new database, you must be aware of the database administrator credentials.
- (Conditional) If you want to migrate the data to an existing database that resides on the MS SQL server in your network, the newly created user must be assigned the db_owner database role and you must procure the database credentials of the newly created user from the database administrator.
- Manually stop the ZENworks services running on all other ZENworks Servers in the Management Zone.
  - **On Windows:**
    1. Execute the following command at the server prompt:

       `novell-zenworks-configure -c Start`
    2. Enter the number next to the `Stop` action.
  - **On Linux:**
    1. Execute the following command at the server prompt:

       `/opt/novell/zenworks/bin/novell-zenworks-configure -c Start`
    2. Enter the number next to the `Stop` action.

- Ensure that the Novell ZENworks Embedded Datastore service on the Primary Server is running.
  - **On Windows:**
    1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
    2. Double-click **Administrative Tools** > **Services**.
    3. Ensure that the status of the **Novell ZENworks Embedded Datastore** service is **Started**.
  - **On Linux:** At the console prompt, enter
    - `/etc/init.d/sybase-asa status` on SLES 11.
    - `systemctl status sybase-asa.service` on SLES 12.
- Ensure that the Novell ZENworks Embedded Datastore for auditing service on the Primary Server is running.
  - **On Windows:**
    1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
    2. Double-click **Administrative Tools** > **Services**.
    3. Ensure that the status of the **Novell ZENworks Embedded Datastore For Auditing** service is **Started**.
  - **On Linux:** At the console prompt, enter
    - `/etc/init.d/sybase-audit-asa status` on SLES 11.
    - `systemctl status sybase-audit-asa.service` on SLES 12.
- (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, perform the following in the `novell-zenworks-configure.properties` file:
  1. Set the value of `Logger.logLevel` to the appropriate message type.

     For example, if you want messages of the type Finest to be logged:

     ```
     #Logger.logLevel   = FINEST
     ```

  2. Uncomment the line by removing the "#" as follows:

     ```
     Logger.logLevel   = FINEST
     ```

  The `novell-zenworks-configure.properties` file is located in *%ZENWORKS_HOME%*`\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

Migrating the Data from the Internal Sybase Database to an MS SQL Database

- "Migrating the Data from the Internal Sybase Database to an MS SQL Database" on page 51
- "Resuming the Database Migration" on page 53

Migrating the Data from the Internal Sybase Database to an MS SQL Database

1. Ensure that all the tasks listed in "Preparing to Move the Data" on page 49 are completed.
2. Run the database migration utility.
   - **On the Windows Primary Server:** At the command prompt, go to *ZENworks_installation_path*\bin\, then enter the following command:

     ```
     novell-zenworks-configure.bat -c DBMigrateConfigureAction
     ```
   - **On the Linux Primary Server:** At the console prompt, go to /opt/novell/zenworks/bin, then enter the following command:

     ```
     novell-zenworks-configure -c DBMigrateConfigureAction
     ```
3. Select the target database type as sql-server.
4. Choose the purging option for data before database migration.
5. Enter the IP address or host name of the MS SQL database server.
6. Enter the port used by the MS SQL database server.
7. (Optional) Enter the named instance for the MS SQL Server engine.
8. Choose to create a new database or use an existing database on the MS SQL server.

   If you choose to create a new database, continue with Step 9.

   If you choose to use an existing database, skip to Step 10.
9. (Conditional) If you choose to create a new database in Step 8, perform the following tasks:

   9a Select the authentication type (Windows or SQL Server) to be used for the database administrator user.

   9b Enter the database server administrator user name.

   9c Enter the database server administrator password.

   9d (Conditional) If you choose Windows authentication in Step 9a, enter the database administrator's domain name.
10. Select the authentication type (Windows or SQL Server) to be used for the database access user.
11. Enter the database access user name.
12. Enter the database access user password.
13. (Conditional) If you choose Windows authentication in Step 10, enter the database access user's domain name.
14. Enter the name of the database on the MS SQL server to which you want to migrate the data. If you choose to create a new database in Step 8, the database is created on the MS SQL server with the name that you specify in this step.
15. (Conditional) If you choose to create a new database in Step 8, enter the complete path where you want the database to be created. You must select the existing folder.
16. Perform the steps from Step 5 to Step 15 for ZENworks audit database. The database migration starts.

17 When the database migration is complete, you can verify the `novell-zenworks-configure.log` file to see if the migration was successful. The log file is located in `%ZENWORKS_HOME%\log\` on the Windows Primary Server and in `/var/opt/novell/log/zenworks/` on the Linux Primary Server.

18 Remove the Novell ZENworks Embedded Datastore service from the device that has the internal Sybase database installed:

On the Windows device: Perform the following tasks:

1. At the server prompt, execute the following command:

   ```
   sc delete SQLANYs_ZENDatastore
   sc delete SQLANYs_ZENAuditDatastore
   ```

2. Edit the`%ZENWORKS_HOME%\conf\monitor.conf` to remove `dbsrv10` from the line `highpriority=zenserver,casaserver,dbsrv10`.

On the Linux device: Perform the following tasks:

1. At the console prompt execute the following:
   - On Sybase Database
     - `/etc/init.d/sybase-asa stop` on SLES 11
     - `systemctl stop sybase-asa.service` on SLES 12
   - On Audit Database
     - `/etc/init.d/sybase-audit-asa stop` on SLES 11
     - `systemctl stop sybase-audit-asa.service` on SLES 12.
2. Perform any of the following:
   - On SLES 11:
     1. Rename sybase-asa to sybase-asa1 by executing the following command:

        ```
        mv sybase-asa sybase-asa1
        ```

     2. Edit the `/etc/opt/novell/zenworks/monitor.conf` to remove `sybase-asa` from the line `services=novell-zenserver novell-zenload sybase-asa`.
   - On SLES 12:

     Rename `sybase-asa.service` to `sybase-asa.service1` in the `/usr/lib/systemd/system` folder.

19 After the database is migrated, continue with the following steps:.

19a Perform post-migration tasks. See "Post-Migration Tasks" on page 53.

19b Re-configure the ZENworks Reporting Server to point to the MS SQL database, because it will still be pointing to the Sybase database.

Resuming the Database Migration

If the migration of the database is stopped for any reason, the ZENworks migration utility allows you to resume the migration if the `dbmigration.xml` file has been created. The file is located in the *%ZENWORKS_HOME%*`\bin` directory on the Windows Primary Server, and in the `/opt/ novell/zenworks/bin` directory on the Linux Primary Server.

1. Run the database migration utility.
   - **On the Windows Primary Server:** At the command prompt, go to *ZENworks_installation_path*`\bin\`, then enter the following command:

     ```
     novell-zenworks-configure.bat -c DBMigrateConfigureAction
     ```
   - **On the Linux Primary Server:** At the console prompt, go to `/opt/novell/zenworks/bin`, then enter the following command:

     ```
     novell-zenworks-configure -c DBMigrateConfigureAction
     ```
2. Enter the target database type as sql database server.
3. Enter the IP address or host name of the MS SQL database server.

   You must specify the IP address or host name of the MS SQL database server used while migrating the database. For example, if you had specified the IP address of the database server while migrating the database, then you must specify the same IP address while resuming the database migration. You cannot specify the host name of the database server.
4. (Optional) Enter the named instance of the MS SQL Server engine.
5. Choose to use an existing database.
6. Enter the credentials of the database user depending on the authentication mode selected.
7. Enter the database name.
8. Choose to resume the database migration.

   The database migration starts.
9. After the database is successfully migrated, continue with "Post-Migration Tasks" on page 53.

Post-Migration Tasks

If there is only one server in the Management Zone, all ZENworks services are automatically started after the data is successfully migrated to an MS SQL Server database.

If there are multiple servers in the Management Zone:

1. On the device where you ran the migration utility, copy the following files to the appropriate directory on all the servers:

   ```
   zdm.xml
   dmaccounts.properties
   dmmappings.properties
   zenaudit.xml
   zenaudit_dmaccounts.properties
   ```

   The files are located in the *%ZENWORKS_HOME%*`\conf\datamodel` directory on Windows and in the `/etc/opt/novell/zenworks/datamodel` directory on Linux.

Ensure that you run `permissions.sh` script located at `/opt/novell/zenworks/bin` on the Linux server after copying the above listed files.

2 Start all the ZENworks services on all the ZENworks Servers in the Management Zone.

- **On Windows:**
  1. Execute the following command at the server prompt:

     ```
     novell-zenworks-configure -c Start
     ```

  2. Enter the number next to the `Start` action.
- **On Linux:**
  1. Execute the following command at the server prompt:

     ```
     /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
     ```

  2. Enter the number next to the `Start` action.

The ZENworks Server now points to the new database.

NOTE: Ensure not to delete the ZENworks Sybase database files if you want to revert to ZENworks Sybase database later.

---

9 Configuring PostgreSQL

Each Primary Server on PostgreSQL can consume up to 300 database connections. If you want to add more than one Primary Server, you should change the property values in the postgresql.conf file.

For the embedded database, the postgresql.conf file is available at the following location:

- **On Windows:** `ZENworks\database\pgsql\data\postgresql.conf`
- **On Linux:** `zenworks/database/pgsql/data/postgresql.conf`

Use the following formula to calculate the property values.

max_connections = Number of primary severs * 300

max_prepared_transactions = Number of primary severs * 300

After changing the property values in `postgresql.conf`, restart the ZENworks and PostgreSQL service.

10 Migrating the Data from an Internal Sybase Database to the PostgreSQL Database

Now, you can use the new Database Migration tool, or ZENworks 2020 installer to migrate the Sybase database to the PostgreSQL database. For more information, see Sybase to PostgreSQL Migration.

The migration tool can be downloaded from the ZENworks 2020 download site.

NOTE: Ensure that you download 2.0 (`db-migration-tool-2.0.zip`) or higher version.

---

11 Updating the Remote PostgreSQL database

Prerequisites:

- Before updating the zone, update the database server.
- Ensure all ZENworks services are stopped.

To upgrade the remote PostgreSQL database, perform the following:

On SLES 11 Database Server

1. 1.After importing ZENworks 2017 Update-2 into the zone, copy novell-zenworks-postgresql-9.5.8-2.x86_64.rpm from the following location:

   On Windows Primary Server: `%ZENWORKS_HOME%\work\content-repo\system-update\<update2-UID>\rpm\novell-zenworks-postgresql-9.5.8-2.x86_64.rpm`

   On Linux Primary Server `/var/opt/novell/zenworks/content-repo/system-update/<update2-UID>/rpm/novell-zenworks-postgresql-9.5.8-2.x86_64.rpm`

   Where *<update2-UID>* is the ZENworks 2017 Update-2 GUID.
2. Stop the database service by running the following command:

   ```
   /etc/init.d/zenpostgresql stop
   ```
3. Run the following RPM package upgrade command:

   ```
   /bin/rpm  -U  -vv  <rpm-file-path>
   ```

   Where *<rpm-file-path>* is path where the RPM file is saved.
4. Run to following script to add the zenpostgres users

   ```
   /opt/novell/zenworks/share/pgsql/bin/zenpostgres_useradd.sh
   ```
5. Start the database service by running the following command:

   ```
   /etc/init.d/zenpostgresql start
   ```

On SLES 12 Database Server

1. After importing ZENworks 2017 Update-2 into the zone, copy novell-zenworks-postgresql-9.5.8-2.x86_64.rpm from the following location:

   On Windows Primary Server: `%ZENWORKS_HOME%\work\content-repo\system-update\<update2-UID>\rpm\novell-zenworks-postgresql-9.5.8-2.x86_64.rpm`

   On Linux Primary Server `/var/opt/novell/zenworks/content-repo/system-update/<update2-UID>/rpm/novell-zenworks-postgresql-9.5.8-2.x86_64.rpm`

   Where *<update2-UID>* is the ZENworks 2017 Update-2 GUID.
2. Stop the database service by running the following command:

```
/bin/rpm  -U  -vv  --replacefiles <rpm-file-path>
```

3. Run the RPM package upgrade command:

   ```
   bin/rpm  -U  -vv  --replacefiles <rpm-file-path>
   ```

   Where *<rpm-file-path>* is path where the RPM file is saved.

4. Run to following script to add the zenpostgres users.

   ```
   /opt/novell/zenworks/share/pgsql/bin/zenpostgres_useradd.sh
   ```

5. Start the database service by running the following command:

   ```
   systemctl start zenpostgresql.service
   ```

On Windows Database Server

1. After importing ZENworks 2017 Update-2 into the zone, copy novell-zenworks-postgresql-9.5.8-2.x86_64.msi from the following location:

   On Windows Primary Server: `%ZENWORKS_HOME%\work\content-repo\system-update\<update2-UID>\msi\novell-zenworks-postgresql-9.5.8-2.x86_64.msi`

   On Linux Primary Server `/var/opt/novell/zenworks/content-repo/system-update/<update2-UID>/msi/novell-zenworks-postgresql-9.5.8-2.x86_64.msi`

   Where *<update2-UID>* is the ZENworks 2017 Update-2 GUID.

2. Stop the database service:

   From Command Prompt: `net stop "Novell ZENworks Embedded Datastore – PostgreSQL"`

   or

   From the Windows Service Manager stop the Novell ZENworks Embedded Datastore - PostgreSQL service

3. Run the MSI package upgrade command:

   ```
   C:\Windows\system32\msiexec.exe -i "<msi-file-path>" TARGETDIR="<zenworks-share-directory>" REBOOT=ReallySuppress ALLUSERS=1 /lvx*+ "<msi-log-file>" /qn
   ```

   Where

   - <msi-file-path> is the path where the MSI file is saved.
   - <zenworks-share-directory> is the location of ZENworks share folder.

     For example: %ZENWORKS_HOME%\share
   - <msi-log-file> is the location when you want to save the log file.

4. Start the database service by any one of the following:

   From Command Prompt: `net start "Novell ZENworks Embedded Datastore – PostgreSQL"`

   or

   From the Windows Service Manager start the Novell ZENworks Embedded Datastore - PostgreSQL service

NOTE: If the PostgreSQL database is embedded, then update the first Primary Server and deploy to other servers.

II External Database Maintenance

- Chapter 12, “Backing Up the External Sybase Database,” on page 65
- Chapter 13, “Restoring the External Sybase Database,” on page 77
- Chapter 14, “Moving the Data from One External Sybase Database to another External Sybase Database,” on page 79
- Chapter 15, “Moving the Data from an External OEM Sybase Database to an Embedded Sybase Database,” on page 83
- Chapter 16, “Migrating the Data from the External Sybase Database to an External Oracle Database,” on page 85
- Chapter 17, “Migrating the Data from the MS SQL Database to an Oracle Database,” on page 91
- Chapter 18, “Configuring the ZENworks Server to Point to the New MS SQL Database Containing Data Moved from Another MS SQL Database,” on page 97
- Chapter 19, “Configuring the ZENworks Server to Point to the New Oracle Database Containing Data Moved from Another Oracle Database,” on page 101
- Chapter 20, “Migrating the Data from an External Sybase SQL Anywhere to an MS SQL Database,” on page 103
- Chapter 21, “Migrating 32-bit OEM Sybase database to 64-bit Sybase on a 64-bit machine,” on page 109
- Chapter 22, “Creating External PostgreSQL Database Schema,” on page 111
- Chapter 23, “Migrating the Data from an External Sybase Database to an External PostgreSQL Database,” on page 113
- Chapter 24, “Migrating the Data from an Oracle Database to an MS SQL Database,” on page 115
- Chapter 25, “Migrating the data from an MS SQL Server to a PostgreSQL Database,” on page 121

12 Backing Up the External Sybase Database

When an external Sybase database (Remote OEM Sybase or Remote Sybase SQL Anywhere) has been installed by using the ZENworks installation media, you can back it up to a directory on the local machine or to a network location.

This documentation provides instructions to back up the external Sybase database by using the DBISQL utility. You can choose to back up the database by using any other utility that is recommended in the Sybase SQL Anywhere documentation.

- "Backing Up the External Sybase Database on a Windows or Linux Server" on page 65
- "Backing up the External Sybase Database Running on a Windows Server to a Network Location on a Remote Windows Machine" on page 68
- "Backing up the External Sybase Database Running on a Linux Server to a Network Location on a Remote Linux Machine" on page 72

IMPORTANT

If the database is located on a ZENworks Server, you must first restore the ZENworks Server, then restore the ZENworks database. Ensure that you have backed up the ZENworks Server and the database (at least once). You can also back up the ZENworks database on a regular basis. However, you can back up the server and the database in any order.

For more information about backing up and restoring the ZENworks Server, see "Backing Up and Restoring the ZENworks Server and Certificate Authority" in the *ZENworks Disaster Recovery Reference*.

Backing Up the External Sybase Database on a Windows or Linux Server

1. On the Windows or Linux server that has the external Sybase database installed and running, launch the DBISQL utility:
   - **1a** At the command prompt, go to the `%ZENWORKS_HOME%\sybase\ASA\BIN32` directory on Windows or to the `/opt/novell/zenworks/share/sybase/bin32s` directory on Linux.
   - **1b** On Windows enter the `dbisql` command, or on Linux enter the `./dbisql` command.
   - **1c** In the **Connection** page, specify the following fields:
     - Specify the database credentials.
     - In **Action**, select **Connect to running database on another computer.**
     - In **Host**, specify the host name or IP address.
     - In **Port**, specify 2638 for ZENworks database, or 2639 for Audit database.

1d Click the **Database** tab, then specify the name of database service that is currently running.

1e Click **OK**.

2 Decide whether you want to immediately back up the external Sybase database or to schedule the backup to run at a specific time. To immediately back up the database, continue with Step 2a. To schedule the backup to run at a specific time, skip to Step 3.

NOTE: You need to stop the services before taking a manual backup of the database. In a scheduled backup, the command used for taking database backup stops the service before the backup.

2a Stop the ZENworks services on the ZENworks Servers in the Management Zone For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

2b To immediately back up the embedded Sybase SQL Anywhere database to a directory on the database server, do one of the following:

- Specify the following query in the **SQL Statements** section of the DBISQL utility:

  ```
  BACKUP DATABASE DIRECTORY
  'complete_path_of_the_backup_directory_on_database_server'
  TRANSACTION LOG TRUNCATE
  ```

  If you want to back up the database to a directory on Windows, you must use \\ (double backslash) as the delimiter while specifying the database backup directory path.

  Examples:

  - **On Windows:** To back up the database to the `c:\dbbackup` directory, execute the following query:

    ```
    BACKUP DATABASE DIRECTORY 'c:\\dbbackup' TRANSACTION LOG
    TRUNCATE
    ```

  - **On Linux:** To back up the database to the `/root/dbBackup` directory, execute the following query:

    ```
    BACKUP DATABASE DIRECTORY '/root/dbBackup' TRANSACTION LOG
    TRUNCATE
    ```

  You must manually archive the complete path of the database backup location that you specify in the query because you need to specify it when you want to change the database backup location at a later time.

- Manually copy `zenworks_zone_name.db` and `zenworks_zone_name.log` from the database server to the new location where you want to back up the database.

  By default, the files are located in *`ZENworks_Installation_directory`*`\Novell\Zenworks\Database` on a Windows Sybase database server, and in `/var/opt/novell/zenworks/database/` on a Linux Sybase database server.

2c Click **Execute SQL Statement(s)**.

2d Start the ZENworks services on the ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

3 To schedule the backup to run at a specific time every day or on specific days of a month:

1. Execute the following query by specifying it in the **SQL Statements** section

```
CREATE EVENT backup_schedule_name

SCHEDULE

START TIME specify_the_schedule

HANDLER

BEGIN

BACKUP DATABASE DIRECTORY
'complete_path_of_the_backup_directory_on_database_server'

TRANSACTION LOG TRUNCATE

END;
```

2. Click **Execute SQL Statement(s)**.

   While creating a database backup event, use the following guidelines:

   - The backup schedule name must be unique.
   - If you want to back up the database to a directory on Windows, you must use \\ (double backslash) as the delimiter while specifying the database backup directory path. For example, `c:\\dbbackup`.
   - You must manually archive the backup schedule that you specify in the query because you need to specify it when you want to change the database schedule at a later time.

Examples:

- To back up the database at a 1:00 a.m. every day to the `/var/` directory on Linux, execute the following query:

```
CREATE EVENT ZENDBbackup

SCHEDULE

START TIME '1:00 AM' EVERY 24 HOURS

HANDLER

BEGIN

BACKUP DATABASE DIRECTORY '/var/'

TRANSACTION LOG TRUNCATE

END;
```

- To back up the database at a 1:00 a.m. on the first, second, third, and fourth day of the month to the `c:\dbbackup` directory on Windows, execute the following query:

```
CREATE EVENT ZENDBbackup

SCHEDULE

START TIME '1:00 AM' EVERY 24 HOURS ON (1,2,3,4)

HANDLER
```

```
BEGIN
BACKUP DATABASE DIRECTORY 'c:\\dbbackup'
TRANSACTION LOG TRUNCATE
END;
```

- To back up the database to the `/var/day_of_the_week` directory on Linux, execute the following query:

```
CREATE EVENT ZENDBbackup
SCHEDULE
START TIME '1:00 AM' EVERY 24 HOURS
HANDLER
BEGIN
DECLARE backupDir varchar(256);
DECLARE backup_stmt varchar(512);
SET backupDir = DAYNAME(now());
SET backup_stmt = 'BACKUP DATABASE DIRECTORY '|| '''/var//' ||
backupDir || ''''|| ' TRANSACTION LOG TRUNCATE';
EXECUTE IMMEDIATE backup_stmt;
END;
```

According to the backup schedule, the `zenworks_zone_name.db` database file and the `zenworks_zone_name.log` transaction log file are created in the database backup directory.

If you want to change the database backup location or the backup schedule at a later time, see "Changing the Backup Schedule and Location of the External Sybase Database Subsequent to the Initial Backup" on page 133.

Backing up the External Sybase Database Running on a Windows Server to a Network Location on a Remote Windows Machine

To back up an external Sybase database that is installed and running on a Windows server to a network location on another Windows machine, you need a local machine and a remote machine. The local machine is a Windows server with the external Sybase database installed. The remote machine is a Windows machine that has the network location to which you want to back up the database.

1. Perform the following steps on the local machine:

   1a. Create an administrative user and specify a password.

   For example, you could specify the administrative user name as `Administrator` and the password as `novell`.

1b From the desktop **Start** menu, click **Settings**, click **Control Panel**, double-click **Administrative Tools**, then double-click **Services**.

1c Right-click the **Novell ZENworks Datastore** service, then click **Properties**.

1d Click the **Log On** tab.

1e Select **This account**, then specify the name and the password of the administrative user you created in Step 1a.

For example, specify the user as `Administrator` and the password as `novell`.

1f Click **OK**.

2 Perform the following steps on the remote machine that has the network location where you want to save the backup:

2a Create an account with the same credentials as the user you created in Step 1a.

For example, specify user as `Administrator` and password as `novell`.

2b Provide Read/Write permission on the network location to the user.

3 Launch the DBISQL utility on the local machine. For more information, see Step 1 on page 65 in the "Backing Up the External Sybase Database on a Windows or Linux Server" on page 65.

4 Decide whether you want to immediately back up the external Sybase database or to schedule the backup to run at a specific time. To back up the database immediately, continue with Step 4a. To schedule the backup to run at a specific time, skip to Step 5.

4a Stop the ZENworks services on the ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

4b To immediately back up the embedded Sybase SQL Anywhere database to the network location on the remote machine, do one of the following:

- Specify the following query in the **SQL Statements** section of the DBISQL utility:

  ```
  BACKUP DATABASE DIRECTORY
  '\\\\IP_address_of_remote_machine\\backup_directory\\custom_dir
  ectory' TRANSACTION LOG TRUNCATE
  ```

  In the query, `\\\\IP_address_of_the_remote_machine\\backup_directory\\` is the shared network location on the remote machine and *`custom_directory_name`* is a name that you specify for a directory to be newly created and into which the database files are to be backed up.

  For example, execute the following query to back up the database to the `dbbackup` directory:

  ```
  BACKUP DATABASE DIRECTORY
  '\\\\shared_network_location_on_remote_machine\\dbbackup'
  TRANSACTION LOG TRUNCATE
  ```

  You must manually archive the complete path of the database backup location that you specify in the query because you need to specify it if you want to change the database backup location at a later time.

- Manually copy `zenworks_zone_name.db` and `zenworks_zone_name.log` from the database server to a required location on the remote machine.

  By default, the files are located in *`ZENworks_Installation_directory`*`\Novell\Zenworks\Database` on a Windows Sybase database server.

4c Click **Execute SQL Statement(s)**.

4d Start the ZENworks services on the ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

5 To schedule the backup to run at a specific time every day or on specific days of a month:

1. Execute the following query by specifying it in the **SQL Statements** section:

```
CREATE EVENT backup_schedule_name

SCHEDULE

START TIME specify_the_schedule

HANDLER

BEGIN

BACKUP DATABASE DIRECTORY
'\\\\IP_address_of_remote_machine\\backup_directory\\custom_directo
ry'

TRANSACTION LOG TRUNCATE

END;
```

   In the query, `\\\\IP_address_of_the_remote_machine\\backup_directory\\` is the shared network location on the remote machine and *custom_directory_name* is a name that you specify for a directory to be newly created and into which the database files are to be backed up.

   While creating a database backup event, use the following guidelines:

   - The backup schedule name must be unique.
   - You must manually archive the backup schedule that you specify in the query because you need to specify it if you want to change the database schedule at a later time.

2. Click **Execute SQL Statement(s)**.

Examples:

- To back up the database at a 1:00 A.M. everyday to the `dbbackup` directory on Windows, execute the following query:

```
CREATE EVENT ZENDBbackup

SCHEDULE

START TIME '1:00 AM' EVERY 24 HOURS

HANDLER

BEGIN

BACKUP DATABASE DIRECTORY
'\\\\shared_network_location_on_remote_machine\\dbbackup'

TRANSACTION LOG TRUNCATE

END;
```

- To back up the database at a 1:00 A.M. on the first, second, third, and fourth day of the month to the `dbbackup` directory on a Windows server, execute the following query:

```
CREATE EVENT ZENDBbackup

SCHEDULE

START TIME '1:00 AM' EVERY 24 HOURS ON (1,2,3,4)

HANDLER

BEGIN

BACKUP DATABASE DIRECTORY
'\\\\shared_network_location_on_remote_machine\\dbbackup'

TRANSACTION LOG TRUNCATE

END;
```

- To back up the database to the `\dbbackup\day_of_the_week` directory on a Windows server, execute the following query:

```
CREATE EVENT ZENDBbackup

SCHEDULE

START TIME '1:00 AM' EVERY 24 HOURS

HANDLER

BEGIN

DECLARE backupDir varchar(256);

DECLARE backup_stmt varchar(512);

SET backupDir = DAYNAME(now());

SET backup_stmt = 'BACKUP DATABASE DIRECTORY '||
'''\\\\shared_network_location_on_remote_machine\\dbbackup/' ||
backupDir || ''''|| 'TRANSACTION LOG TRUNCATE';

EXECUTE IMMEDIATE backup_stmt;

END;
```

According to the backup schedule, `zenworks_zone_name.db` and `zenworks_zone_name.log` are created in the network location on the remote machine. The backed-up database is stored in `zenworks_zone_name.db`. The result of the database backup is logged in `zenworks_zone_name.log`.

If you want to change the database backup location or the backup schedule at a later time, see "Changing the Backup Schedule and Location of the External Sybase Database Subsequent to the Initial Backup" on page 133.

Backing up the External Sybase Database Running on a Linux Server to a Network Location on a Remote Linux Machine

To back up the external Sybase database that is installed and running on a Linux server to a network location on a Linux machine, you need a local machine and a remote machine. The local machine is a Linux server with the external Sybase database installed. The remote machine is a Linux machine that has the network location to which you want to back up the database.

You can back up the database on a Linux machine by using any Linux share such as Samba share or an NFS share.

To back up the external Sybase database that is installed and running on a Linux server to a network location on a Linux machine by using Samba share:

1. Create a Samba share on the remote machine:
   - **1a** Create a user by entering the `useradd` *`user_name`* command at the command prompt.
   - **1b** Log into the remote machine with the user name you created in Step 1a, and set the password by using the `passwd` *`specify_the_password`* command.
   - **1c** Create a directory to save the database backup.

     For example, create a directory with the name `backup`.
   - **1d** Open the Samba server settings by running the `yast2 samba-server` command.
   - **1e** Click the **Shares** tab, then click **Add** to specify the share name and the path to the backup directory you created in Step 1c.

     For example, specify the share name as `dbbackup`.
   - **1f** Select the `dbbackup` share, click **Edit**, then add the following attributes:
     - create mask = 0640
     - force user = *user_name_created_in_*Step 1a
     - guest ok = yes
     - public = yes
     - wide links = no
     - writeable = yes
2. Create a directory on the local machine.

   For example, create a directory with the name `zenworks_dbbackup` in `/root`.
3. Mount the Samba share on the `zenworks_dbbackup` directory on the local machine by entering the following command at the command prompt:

   `mount -t smbfs //IP_address of the remote_machine/share_name -o username=user_name_specified_in_Step1a,password=password_specified_in_Step_1b local_directory_name_with_complete_path_created_in_Step2`

   For example:

   `mount -t smbfs //IP_address of the remote_machine/dbbackup -o username=user_name_specified_in_Step1a,password=password_specified_in_Step_1b /root/zenworks_dbbackup`

4 Launch the DBISQL utility on the local machine. For more information, see Step 1 on page 65 in the "Backing Up the External Sybase Database on a Windows or Linux Server" on page 65.

5 Decide whether you want to immediately back up the external Sybase database or to schedule the backup to run at a specific time. To back up the database immediately, continue with Step 5a. To schedule the backup to run at a specific time, skip to Step 6.

5a Stop the ZENworks services on the ZENworks Servers in the Management Zone.

5a1 Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

5a2 Enter the number next to the `Stop` action.

5b To immediately back up the external Sybase database to the network location on the remote machine, do one of the following:

- Specify the following query in the **SQL Statements** section of the DBISQL utility:

  ```
  BACKUP DATABASE DIRECTORY
  'complete_path_of_the_backup_directory_on_database_server'
  TRANSACTION LOG TRUNCATE
  ```

  For example, execute the following query to back up the database to the `/root/zenworks_dbbackup` directory:

  ```
  BACKUP DATABASE DIRECTORY '/root/zenworks_dbbackup/' TRANSACTION
  LOG TRUNCATE
  ```

  You must manually archive the complete path of the database backup location that you specify in the query because you need to specify it if you want to change the database backup location at a later time.

- Manually copy `zenworks_zone_name.db` and `zenworks_zone_name.log` from the database server to a required location on the remote machine.

  By default, the files are located in `/var/opt/novell/zenworks/database/` on a Linux Sybase database server.

5c Click **Execute SQL Statement(s)**.

5d Start the ZENworks services on the ZENworks Servers in the Management Zone .

5d1 Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

5d2 Enter the number next to the `Start` action.

6 To schedule the backup to run at a specific time every day or on specific days of a month:

1. Execute the following query by specifying it in the **SQL Statements** section:

```
CREATE EVENT backup_schedule_name

SCHEDULE

START TIME specify_the_schedule

HANDLER

BEGIN

BACKUP DATABASE DIRECTORY
'complete_path_of_the_backup_directory_on_database_server'
```

```
TRANSACTION LOG TRUNCATE
END;
```

While creating a database backup event, use the following guidelines:

- The backup schedule name that you specify must be unique.
- You must manually archive the backup schedule that you specify in the query because you need to specify it if you want to change the database schedule at a later time.

2. Click **Execute SQL Statement(s)**.

Examples:

- To back up the database at a 1:00 A.M. everyday to the `/root/zenworks_dbbackup` directory on Linux, execute the following query:

```
CREATE EVENT ZENDBbackup
SCHEDULE
START TIME '1:00 AM' EVERY 24 HOURS
HANDLER
BEGIN
BACKUP DATABASE DIRECTORY '/root/zenworks_dbbackup/'
TRANSACTION LOG TRUNCATE
END;
```

- To back up the database at a 1:00 a.m. on the first, second, third, and fourth day of the month to the `/root/zenworks_dbbackup` directory on Linux, execute the following query:

```
CREATE EVENT ZENDBbackup
SCHEDULE
START TIME '1:00 AM' EVERY 24 HOURS ON (1,2,3,4)
HANDLER
BEGIN
BACKUP DATABASE DIRECTORY '/root/zenworks_dbbackup/'
TRANSACTION LOG TRUNCATE
END;
```

- To back up the database to the `/root/zenworks_dbbackup/`*`day_of_the_week`* directory on Linux, execute the following query:

```
CREATE EVENT ZENDBbackup
SCHEDULE
START TIME '1:00 AM' EVERY 24 HOURS
HANDLER
```

```
BEGIN

DECLARE backupDir varchar(256);

DECLARE backup_stmt varchar(512);

SET backupDir = DAYNAME(now());

SET backup_stmt = 'BACKUP DATABASE DIRECTORY '|| '''/root/
zenworks_dbbackup//' || backupDir || ''''|| ' TRANSACTION LOG
TRUNCATE';

EXECUTE IMMEDIATE backup_stmt;

END;
```

According to the backup schedule, `zenworks_zone_name.db` and `zenworks_zone_name.log` are created in the network location on the remote machine (`/root/zenworks_dbbackup`). The backed-up database is stored in `zenworks_zone_name.db`. The result of the database backup is logged in `zenworks_zone_name.log`.

If you want to change the database backup location or the backup schedule at a later time, see "Changing the Backup Schedule and Location of the External Sybase Database Subsequent to the Initial Backup" on page 133.

13 Restoring the External Sybase Database

IMPORTANT

If the database is located on a ZENworks Server, you must first restore the ZENworks Server, then restore the ZENworks database. Ensure that you have backed up the ZENworks Server and the database (at least once). You can also back up the ZENworks database on a regular basis. However, you can back up the server and the database in any order.

For more information about backing up and restoring the ZENworks Server, see "Backing Up and Restoring the ZENworks Server and Certificate Authority" in the *ZENworks Disaster Recovery Reference*.

You can choose to restore the backed-up external Sybase database (Remote OEM Sybase or Remote Sybase SQL Anywhere) on the same device that has database server installed or to a different device.

To restore the backed-up external Sybase database:

1. Stop the Novell ZENworks Embedded Datastore service on the database server on which you want to restore the backed-up database. If you choose to restore the backed-up database on a different device, you must stop the service on that device as well as on the database server.
   - **On Windows:**
     1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
     2. Double-click **Administrative Tools** > **Services**.
     3. Right-click the **Novell ZENworks Embedded Datastore** service, then click **Stop**, or select the **Novell ZENworks Embedded Datastore** service, then click ■ on the toolbar.
   - **On Linux:** At the console prompt, enter
     - `/etc/init.d/sybase-asa stop` on SLES 11.
     - `systemctl stop sybase-asa.service` on SLES 12.
2. Stop the ZENworks services on the ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.
3. Copy the following files from the device where the external Sybase database is backed up to the device on which you want to restore the external Sybase database:
   - `zenworks_`*`zone_name`*`.db`
   - `zenworks_`*`zone_name`*`.log`

   By default, the files must be copied to the *`ZENworks_Installation_directory:`*`\Novell\Zenworks\Database` on a Windows Sybase database server, and to `/var/opt/novell/zenworks/database/` on a Linux Sybase database server.

4 Start the Novell ZENworks Embedded Datastore service on the database server on which you restored the backed-up database. If you have restored the backed-up database to a different device, you must start the service on that device as well as on the database server.

- **On Windows:** Do the following:
  1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
  2. Double-click **Administrative Tools** > **Services**.
  3. Right-click the **Novell ZENworks Embedded Datastore** service, then click **Start**, or select the **Novell ZENworks Embedded Datastore** service, then click ▶ on the toolbar.
- **On Linux:** At the console prompt, enter
  - `/etc/init.d/sybase-asa start` on SLES 11.
  - `systemctl start sybase-asa.service` on SLES 12.

5 (Conditional) If you restore the database to a location other than the one given in the `zenworks_database.conf` file, you must manually edit the file to specify the new location of the database. The `zenworks_database.conf` file is located by default in the *`zenworks_installation_directory`*`\novell\zenworks\database\conf\` directory on Windows and in the `/etc/opt/novell/zenworks/` directory on Linux.

6 Start the ZENworks services on the ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

14 Moving the Data from One External Sybase Database to another External Sybase Database

ZENworks allows you move the data from one OEM Sybase database (external Sybase database) to another external Sybase database.

- "Preparing to Move the Data" on page 79
- "Moving the Data from One External Sybase to Another External Sybase" on page 79

Preparing to Move the Data

Before moving the data from one external Sybase database to another external Sybase database, do the following:

- Ensure that the ZENworks Server is configured to an external Sybase database. The database can be installed on the ZENworks Server, or on a different Windows or Linux device.The data is moved from this database to another external database. Assume that the device that hosts the database is EDB1.
- Ensure that you have another Windows or Linux device with an external Sybase database installed. Assume that this device to which you are moving the data to is EDB2.

  For more information on how to install an external Sybase database, for Windows, see "Installing an External ZENworks Database" for Linux, see "Installing an External ZENworks Database" in the *ZENworks Server Installation Guide*.

Moving the Data from One External Sybase to Another External Sybase

1 Stop all the ZENworks services on all the ZENworks Servers that are connected to EDB1.
   - **On Windows:**
     1. Execute the following command at the server prompt:

        `novell-zenworks-configure -c Start`
     2. Enter the number next to the `Stop` action.
   - **On Linux:**
     1. Execute the following command at the server prompt:

        `/opt/novell/zenworks/bin/novell-zenworks-configure -c Start`
     2. Enter the number next to the `Stop` action.

2 On EDB1 and EDB2 devices, stop the Novell ZENworks Embedded Datastore service.

- **On Windows:** Perform the following:
  1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
  2. Double-click **Administrative Tools** > **Services**.
  3. Right-click the **Novell ZENworks Embedded Datastore** service, then click **Stop**, or select the **Novell ZENworks Embedded Datastore** service, then click ■ on the toolbar.
- **On Linux:** At the console prompt, enter
  - `/etc/init.d/sybase-asa stop` on SLES 11.
  - `systemctl stop sybase-asa.service` on SLES 12.

3 From the EDB1 device, copy `zenworks_database.conf` and all files within the `database` directory to the appropriate directories on the EDB2 device.

The `zenworks_database.conf` is located in the *`ZENworks_installation_path`*`\conf\` directory on Windows and in the `/etc/opt/novell/zenworks/` directory on Linux.

The `database` directory is located in *`ZENworks_installation_path`* by default on Windows and in the `/var/opt/novell/zenworks/` directory on Linux.

4 On the EDB2 device, open `zenworks_database.conf` and ensure that it contains the correct path of the database file.

5 On each ZENworks Server that is connected to EDB1, edit `zdm.xml` and edit `zenaudit.xml` (located in *`ZENworks_installation_path`*`\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux):

- Set the value of the `Server` entry key to the IP address of the EDB2 device.
- Ensure that the value of the `Port` entry key is the port number on which the EDB2 device is running.

6 On the EDB2 device, start the Novell ZENworks Embedded Datastore service:

- **On Windows:** Do the following:
  1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
  2. Double-click **Administrative Tools** > **Services**.
  3. Right-click the **Novell ZENworks Embedded Datastore** service, then click **Start**, or select the **Novell ZENworks Embedded Datastore** service, then click ▶ on the toolbar.
- **On Linux:** At the console prompt, enter
  - `/etc/init.d/sybase-asa start` on SLES 11.
  - `systemctl start sybase-asa.service` on SLES 12.

7 Start the ZENworks services on the ZENworks Servers in the Management Zone.

- **On Windows:**
  1. Execute the following command at the server prompt:

     ```
     novell-zenworks-configure -c Start
     ```

  2. Enter the number next to the `Start` action.
- **On Linux:**
  1. Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

2. Enter the number next to the `Start` action.

The ZENworks Server now points to new database (EDB2).

15 Moving the Data from an External OEM Sybase Database to an Embedded Sybase Database

ZENworks allows you move the data from an OEM Sybase database (external Sybase database) to a Embedded OEM Sybase SQL Anywhere database (embedded Sybase database) that is installed on the ZENworks Server.

- "Preparing to Move the Data" on page 83
- "Moving the Data from the External Sybase to the Embedded Sybase" on page 83

Preparing to Move the Data

Before moving the data from an external Sybase database to an embedded Sybase database, do the following:

- Ensure that ZENworks is configured to an external OEM Sybase database. The database can be installed on a Windows or Linux device.
- Install the Embedded OEM Sybase database on the ZENworks Server.

  For more information on how to install the database, for Windows, see "Installing an External ZENworks Database" for Linux, see "Installing an External ZENworks Database" in the *ZENworks Server Installation Guide*.

  During the installation of the embedded Sybase database, you must consider the following points while the Sybase Access Configuration page:

  - The database name can be same as that of the external Sybase database or can be a unique name.
  - Ensure that the user name and password are same as that of the external Sybase database.
  - Ensure that the database server name is unique.

Moving the Data from the External Sybase to the Embedded Sybase

1. Stop the ZENworks services on the ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.
2. On the ZENworks Server that has the embedded Sybase database installed, delete the contents of the `database` directory.

   The `database` directory is located in *`ZENworks_installation_path`* on Windows and in the `/opt/novell/zenworks/` directory on Linux.

3 On the device that has the external Sybase database installed, stop the Novell ZENworks Embedded Datastore service.

- **On Windows:** Perform the following:
  1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
  2. Double-click **Administrative Tools** > **Services**.
  3. Right-click the **Novell ZENworks Embedded Datastore** service, then click **Stop**, or select the **Novell ZENworks Embedded Datastore** service, then click ■ on the toolbar.
- **On Linux:** At the console prompt, enter
  - `/etc/init.d/sybase-asa stop` on SLES 11.
  - `systemctl stop sybase-asa.service` on SLES 12.

4 From the device that has the external Sybase database installed, copy all files within the `database` directory to the appropriate directories on the ZENworks Server that has the embedded Sybase database.

The `database` directory is located in *`ZENworks_installation_path`* on Windows and in the `/opt/novell/zenworks/` directory on Linux.

5 On the ZENworks Server that has the embedded Sybase database installed, open `zenworks_database.conf` and ensure that it contains the correct path of the database file.

6 On the ZENworks Server that has the embedded Sybase database installed, edit `zdm.xml` and `zenaudit.xml` (located in *`ZENworks_installation_path`*`\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux):

- Add the following entry:

```
<entry key="Embedded">true</entry>
```

- Set the value of the `Server` entry key to 127.0.0.1 (the IP address of the ZENworks Server that has the embedded Sybase database installed).
- Ensure that the value of the `Port` entry key is the port number on which the embedded Sybase database is running.
- Set the value of the `Engine` entry key to the database server name specified during the installation of the embedded Sybase database.
- (Optional) If you've specified a unique database name during the installation of the embedded Sybase database, set the value of the `Database` entry key to the unique database name.

7 Start the ZENworks services on the ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

The ZENworks Server now points to new database.

16 Migrating the Data from the External Sybase Database to an External Oracle Database

ZENworks allows you migrate the data from the external Sybase database to an Oracle database installed on a device that does not have ZENworks installed.

Review the following to migrate the database:

- "Preparing to Move the Data" on page 85
- "Migrating the Data from the External Sybase Database to an Oracle Database" on page 87
- "Post-Migration Tasks" on page 88

Preparing to Move the Data

Before migrating the data from the Sybase database to Oracle database, do the following:

- Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- Ensure that the Oracle database is installed on a device that does not have ZENworks installed.
- Ensure that the "USERS"/USER-CREATED tablespace has sufficient space to create and store the ZENworks database schema. The tablespace requires a minimum of 100 MB to create ZENworks database schema without any data in it and an appropriate additional space depending upon the size of the database to be migrated. For more information on tablespaces, refer to the section "Prerequisites for Oracle" in *ZENworks Server Installation Guide*.
- Ensure that the NLS_CHARACTERSET parameter is set to AL32UTF8 and the NLS_NCHAR_CHARACTERSET parameter to AL16UTF16 by running the following query at the database prompt:

  ```
  select parameter, value from nls_database_parameters where parameter
  like '%CHARACTERSET%';
  ```

- Ensure that the **sharename**, **filename**, and **path columns** do not contain blank strings in the NC_VRBSOFTWARE table. In case these column have blank strings, delete those records from the table. Deleting these records will remove the usage of these software from database.

  Query to delete the records from **NC_VRBSOFTWARE**:

  ```
  DELETE FROM NC_VRBSOFTWARE WHERE SHARENAME='' OR PATH='' OR FILENAME=''
  OR SHARENAME IS NULL OR PATH IS NULL OR FILENAME IS NULL;
  ```

- (Conditional) If you want to migrate the database by creating a new user schema, ensure that the following additional requirements are met:
  - You must be aware of the database administrator credentials.

NOTE: Ensure that the database administrator has the following privileges:

- GRANT ALL on DBMS_REDEFINITION with GRANT option;
- GRANT ALL on DBMS_DDL with GRANT option;

- A tablespace must already exist for associating to the Oracle access user

- You can choose to migrate the database by using an existing user schema that resides on a server in your network in the following scenario:
  - The database administrator create two user schemas with the necessary rights and you get the credentials for both user schemas from the database administrator. In this case, the database administrator credentials are not required to migrate the database.

  If you want to migrate the database by using an existing user schema, ensure that the following additional requirements are met:

  - Ensure that the user schema has the following rights to create the database.

    ```
    CREATE SESSION
    CREATE_TABLE
    CREATE_VIEW
    CREATE_PROCEDURE
    CREATE_SEQUENCE
    CREATE_TRIGGER
    DBMS_REDEFINITION
    DBMS_DDL
    DBMS_LOCK
    ```

  - Ensure that the quota for the user schema is set to Unlimited on the USERS tablespace.

- Manually stop the ZENworks services running on the ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.
- Ensure that your external Sybase database service is running.
- (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, do the following in the `novell-zenworks-configure.properties` file:

  1. Set the value of `Logger.logLevel` to the appropriate message type.

     For example, if you want messages of the type Finest to be logged:

     ```
     #Logger.logLevel    = FINEST
     ```

  2. Uncomment the line by removing the "#" as follows:

     ```
     Logger.logLevel    = FINEST
     ```

  The `novell-zenworks-configure.properties` file is located in *%ZENWORKS_HOME%*`\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

Migrating the Data from the External Sybase Database to an Oracle Database

- "Migrating the Data from the External Sybase Database to an Oracle Database" on page 87
- "Resuming the Database Migration" on page 88

Migrating the Data from the External Sybase Database to an Oracle Database

1 Ensure that all the tasks listed in "Preparing to Move the Data" on page 85 are completed.

2 Run the database migration utility.

- **On the Windows Primary Server:** At the command prompt, go to *ZENworks_installation_path*\bin\, then enter the following command:

  ```
  novell-zenworks-configure.bat -c DBMigrateConfigureAction
  ```

- **On the Linux Primary Server:** At the console prompt, go to /opt/novell/zenworks/bin, then enter the following command:

  ```
  novell-zenworks-configure -c DBMigrateConfigureAction
  ```

3 Enter the target database type as Oracle.

4 Enter the IP address or host name of the Oracle database server.

5 Enter the port used by the Oracle database server.

6 Enter the fully qualified net service name for the Oracle database.

7 You can choose to create a new user schema or use an existing user schema.

If you choose to create a new schema, continue with Step 8.

If you choose to use an existing user schema, skip to Step 9.

8 Enter the database server administrator's user name and password.

9 Enter the schema name when prompted for the database user name.

10 Enter the database schema password when prompted for the database user's password.

NOTE: The migration utility prompts for inputs as mentioned in Step 3 to Step 9 to migrate audit database as well.

The database migration starts.

11 When the database migration is complete, you can check the novell-zenworks-configure.log file to see if the migration was successful. The log file is located in *%ZENWORKS_HOME%*\log\ on Windows and in /var/opt/novell/log/zenworks/ on Linux.

12 After the database is successfully migrated, continue with the following steps:

12a Perform post-migration tasks. See "Post-Migration Tasks" on page 95.

12b Re-configure the ZENworks Reporting Server to point to the Oracle database, because it will still be pointing to the Sybase database.

Resuming the Database Migration

If the migration of the database is stopped for any reason, the ZENworks migration utility allows you to resume the migration if the `dbmigration.xml` file has been created. The file is located in the *`ZENworks_installtion_path`*`\bin` directory on Windows, and in the `/opt/ novell/zenworks/bin` directory on Linux.

1. Run the database migration utility. For more information, see Step 2 on page 45 in the "Migrating the Data from the Internal Sybase Database to an Oracle Database" on page 45.
2. Enter the target database type as Oracle.
3. Enter the IP address or host name of the Oracle database server.

   You must specify the IP address or host name of the Oracle database server used while migrating the database. For example, if you had specified the IP address of the database server while migrating the database, then you must specify the same IP address while resuming the database migration. You cannot specify the host name of the database server.
4. Enter the port used by the Oracle database server.
5. Enter the fully qualified net service name for the Oracle database.
6. Choose to use an existing schema.
7. Enter the schema name when prompted for the database user name specified before stopping the database migration.
8. Enter the database schema password when prompted for the database user's password specified before stopping the database migration.

   NOTE: The migration utility prompts for inputs as mentioned in Step 3 to Step 8 to migrate audit database as well.
9. Choose to resume the database migration.

   The database migration starts.
10. After the database is successfully migrated, continue with "Post-Migration Tasks" on page 88.

Post-Migration Tasks

If there is only one server in the Management Zone, all ZENworks services are automatically started after the data is successfully migrated to an Oracle database.

If there are multiple servers in the Management Zone:

1. From the device where you ran the migration utility, copy the following files and paste them in the appropriate directory, on all other Primary Servers:

   `zdm.xml`
   `dmaccounts.properties`
   `dmmappings.properties`
   `zenaudit.xml`
   `zenaudit_dmaccounts.properties`

   Ensure that these files have appropriate rights. The files are located in the following path:

   - **Windows:** *`ZENworks_installation_path`*`\conf\datamodel`

- **Linux:** `/etc/opt/novell/zenworks/datamodel`

  Ensure that you run `permissions.sh` script located at `/opt/novell/zenworks/bin` on the Linux server after copying the above listed files.

2. Start the ZENworks services on the ZENworks Servers in the Management Zone.
   - **On Windows:**
     1. Execute the following command at the server prompt:

        ```
        novell-zenworks-configure -c Start
        ```

     2. Enter the number next to the `Start` action.
   - **On Linux:**
     1. Execute the following command at the server prompt:

        ```
        /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
        ```

     2. Enter the number next to the `Start` action.

The ZENworks Server now points to the new database.

For the Oracle 11g database, any administrator name is case sensitive, including login names from user sources. The default ZENworks administrator account automatically created during installation uses an initial capital, so in order to log into ZENworks Control Center, you must enter `Administrator`.

If your zone has ZENworks Reporting, then you must run the ZENworks Reporting Configuration Tool to point to the newly migrated Oracle database.

17 Migrating the Data from the MS SQL Database to an Oracle Database

ZENworks allows you migrate the data from the MS SQL database to an Oracle database installed on a device that does not have ZENworks installed.

Review the following to migrate the database:

- "Preparing to Move the Data" on page 91
- "Migrating the Data from the MS SQL Database to an Oracle Database" on page 93
- "Post-Migration Tasks" on page 95

Preparing to Move the Data

Before migrating the data from the MS SQL database to Oracle database, do the following:

- Run the ZENworks Diagnostic Center (ZDC) and check for schema differences.

  If the ZENworks database tables are not present under the default database schema DBO, then to avoid any issues, contact Micro Focus Customer Center before upgrading your zone.

  To find out the database scheme, run the following query in the Microsoft SQL database:

  ```
  SELECT distinct(SCHEMA_NAME(schema_id)) as OWNER FROM sys.objects WHERE
  type='U'
  ```

  IMPORTANT: If the unique constraint is not created on the serial number column of the zDevice table, database migration from the Microsoft SQL database to the Oracle database might fail. For information, see *"Troubleshooting the database migration failure, duplication of serial numbers in the zDevice table" on page 144*.

- Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- Ensure that the Oracle database is installed on a device that does not have ZENworks installed.
- Ensure that the "USERS"/USER-CREATED tablespace has sufficient space to create and store the ZENworks database schema. The tablespace requires a minimum of 100 MB to create ZENworks database schema without any data in it and an appropriate additional space depending upon the size of the database to be migrated. For more information on tablespaces, refer to the section "Prerequisites for Oracle" in *ZENworks Server Installation Guide*.
- Ensure that the NLS_CHARACTERSET parameter is set to AL32UTF8 and the NLS_NCHAR_CHARACTERSET parameter to AL16UTF16 by running the following query at the database prompt:

  ```
  select parameter, value from nls_database_parameters where parameter
  like '%CHARACTERSET%';
  ```

- Ensure that the **sharename**, **filename**, and **path columns** do not contain blank strings in the NC_VRBSOFTWARE table.
- (Conditional) If you want to migrate the database by creating a new user schema, ensure that the following additional requirements are met:
  - You must be aware of the database administrator credentials.

    NOTE: Ensure that the database administrator has the following privileges:
    - GRANT ALL on DBMS_REDEFINITION with GRANT option;
    - GRANT ALL on DBMS_DDL with GRANT option;
  - A tablespace must already exist for associating to the Oracle access user
- You can choose to migrate the database by using an existing user schema that resides on a server in your network in the following scenario:
  - The database administrator create two user schemas with the necessary rights and you get the credentials for both user schemas from the database administrator. In this case, the database administrator credentials are not required to migrate the database.

  If you want to migrate the database by using an existing user schema, ensure that the following additional requirements are met:
  - Ensure that the user schema must have the following rights to create the database.

    ```
    CREATE SESSION
    CREATE_TABLE
    CREATE_VIEW
    CREATE_PROCEDURE
    CREATE_SEQUENCE
    CREATE_TRIGGER
    DBMS_REDEFINITION
    DBMS_DDL
    DBMS_LOCK
    ```
  - Ensure that the quota for the user schemas is set to Unlimited for the tablespaces to be used.
- Manually stop the ZENworks services running on all the ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.
- Ensure that your external MS SQL database service is running.
- (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, do the following in the `novell-zenworks-configure.properties` file:
  1. Set the value of `Logger.logLevel` to the appropriate message type.

     For example, if you want messages of the type Finest to be logged:

     ```
     #Logger.logLevel   = FINEST
     ```

2. Uncomment the line by removing the "#" as follows:

```
Logger.logLevel    = FINEST
```

The `novell-zenworks-configure.properties` file is located in *%ZENWORKS_HOME%*`\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

IMPORTANT: For better performance depending on the database size and available resource, you can increase the `batchsize` in the `db-migration-mssql-to-oracle.properties` file. It is located in *%ZENWORKS_HOME%*`\novell\zenworks\conf\` on Windows and in `/etc/opt/novell/zenworks/conf/` on Linux.

Migrating the Data from the MS SQL Database to an Oracle Database

- "Migrating the Data from the MS SQL Database to an Oracle Database" on page 93
- "Resuming the Database Migration" on page 94

Migrating the Data from the MS SQL Database to an Oracle Database

1. Ensure that all the tasks listed in "Preparing to Move the Data" on page 91 are completed.
2. Run the database migration utility.
   - **On the Windows Primary Server:** At the command prompt, go to *ZENworks_installation_path*`\bin\`, then enter the following command:

     ```
     novell-zenworks-configure.bat -c DBMigrateConfigureAction
     ```
   - **On the Linux Primary Server:** At the console prompt, go to `/opt/novell/zenworks/bin`, then enter the following command:

     ```
     novell-zenworks-configure -c DBMigrateConfigureAction
     ```
3. Enter the target database type as Oracle.
4. Enter the IP address or host name of the Oracle database server.
5. Enter the port used by the Oracle database server.
6. Enter the fully qualified net service name for the Oracle database.
7. You can choose to create a new user schema or use an existing user schema.

   If you choose to create a new schema, continue with Step 8.

   If you choose to use an existing user schema, skip to Step 9.
8. Enter the database server administrator's user name and password.
9. Enter the schema name when prompted for the database user name.
10. Enter the database schema password when prompted for the database user's password.

NOTE: The migration utility prompts for inputs as mentioned in Step 4 to Step 9 to migrate audit database as well.

The database migration starts.

11 When the database migration is complete, you can check the `novell-zenworks-configure.log` file to see if the migration was successful. The log file is located in *%ZENWORKS_HOME%*`\log\` on Windows and in `/var/opt/novell/log/zenworks/` on Linux.

12 After the database is successfully migrated, continue with the following steps:

   12a Perform post-migration tasks. See "Post-Migration Tasks" on page 95.

   12b Re-configure the ZENworks Reporting Server to point to the Oracle database, because it will still be pointing to the MS SQL database.

Resuming the Database Migration

If the migration of the database is stopped for any reason, the ZENworks migration utility allows you to resume the migration if the `dbmigration.xml` file has been created. The file is located in the *ZENworks_installtion_path*`\bin` directory on Windows, and in the `/opt/ novell/zenworks/bin` directory on Linux.

1 Run the database migration utility.

   - **On the Windows Primary Server:** At the command prompt, go to *ZENworks_installation_path*`\bin\`, then enter the following command:

     ```
     novell-zenworks-configure.bat -c DBMigrateConfigureAction
     ```

   - **On the Linux Primary Server:** At the console prompt, go to `/opt/novell/zenworks/bin`, then enter the following command:

     ```
     novell-zenworks-configure -c DBMigrateConfigureAction
     ```

2 Enter the target database type as Oracle.

3 Enter the IP address or host name of the Oracle database server.

   You must specify the IP address or host name of the Oracle database server used while migrating the database. For example, if you had specified the IP address of the database server while migrating the database, then you must specify the same IP address while resuming the database migration. You cannot specify the host name of the database server.

4 Enter the port used by the Oracle database server.

5 Enter the fully qualified net service name for the Oracle database.

6 Choose to use an existing schema.

7 Enter the schema name when prompted for the database user name specified before stopping the database migration.

8 Enter the database schema password when prompted for the database user's password specified before stopping the database migration.

   NOTE: The migration utility prompts for inputs as mentioned in Step 3 to Step 8 to migrate audit database as well.

9 Choose to resume the database migration.

   The database migration starts.

10 After the database is successfully migrated, continue with "Post-Migration Tasks" on page 95.

Post-Migration Tasks

If there is only one server in the Management Zone, all ZENworks services are automatically started after the data is successfully migrated to an Oracle database.

If there are multiple servers in the Management Zone:

1. From the device where you ran the migration utility, copy the following files and paste them in the appropriate directory, on all other Primary Servers:

   `zdm.xml`
   `dmaccounts.properties`
   `dmmappings.properties`
   `zenaudit.xml`
   `zenaudit_dmaccounts.properties`

   Ensure that these files have appropriate rights. The files are located in the following path:

   - **Windows:** *`ZENworks_installation_path`*`\conf\datamodel`
   - **Linux:** `/etc/opt/novell/zenworks/datamodel`

     Ensure that you run `permissions.sh` script located at `/opt/novell/zenworks/bin` on the Linux server after copying the above listed files.

2. Start all the ZENworks services on all the ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

The ZENworks Server now points to the new database.

For the Oracle 11g database, any administrator name is case sensitive, including login names from user sources. The default ZENworks administrator account automatically created during installation uses an initial capital, so in order to log into ZENworks Control Center, you must enter `Administrator`.

If your zone has ZENworks Reporting, then you must run the ZENworks Reporting Configuration Tool to point to the newly migrated Oracle database.

18 Configuring the ZENworks Server to Point to the New MS SQL Database Containing Data Moved from Another MS SQL Database

If you move the data from one MS SQL database to another MS SQL database, the Windows or Linux ZENworks Server must be configured to point to the new MS SQL database.

The following sections provide detailed information:

- "Preparing to Move the Data" on page 97
- "Configuring the ZENworks Server to Point to the New MS SQL Database" on page 98

Preparing to Move the Data

Before configuring the server to point the new MS SQL database, do the following:

- Run the ZENworks Diagnostic Center (ZDC) and check for schema differences.

  If the ZENworks database tables are not present under the default database schema DBO, then to avoid any issues, contact Micro Focus Customer Center before upgrading your zone.

  To find out the database scheme, run the following query in the Microsoft SQL database:
  `SELECT distinct(SCHEMA_NAME(schema_id)) as OWNER FROM sys.objects WHERE type='U'`
- Ensure that the ZENworks Server is configured to an MS SQL database. Assume that the device that currently host the MS SQL database is called MSDB1.
- Ensure that you have another Windows device with an MS SQL database installed. Assume that this device is called MSDB2. For more information on how to install an MS SQL database, for Windows, see "Installing an External ZENworks Database" for Linux, see "Installing an External ZENworks Database" in the *ZENworks Server Installation Guide*.
- Stop all the ZENworks services on all the ZENworks Servers in the Management Zone.
  - **On Windows:**
    1. Execute the following command at the server prompt:

       `novell-zenworks-configure -c Start`
    2. Enter the number next to the `Stop` action.
  - **On Linux:**
    1. Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

2. Enter the number next to the `Stop` action.

- Move the data from MSDB1 to MSDB2. For more information about moving the data, see the MS SQL database documentation.

Configuring the ZENworks Server to Point to the New MS SQL Database

To configure the ZENworks Server to point to the new database (MSDB2), perform the following tasks on the ZENworks Server:

1. Take back up, and edit the `zdm.xml` and `zenaudit.xml` files (located in *`ZENworks_installation_path`*`\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux) to do the following:
   - Ensure that the value of the `Port` entry key is the port number on which the MS SQL database is running.
   - Set the value of the `Server` entry key to the IP address of the MSDB2 device.
   - Set the value of the `Database` entry key to path of the database directory of the MSDB2 device.
   - If user name or password of the database is changed, then you must change the user name and password in the following locations:
     1. `dmaccounts.properties` and `zenaudit_dmaccounts.properties` files. (located in *`ZENworks_installation_path`*`\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux). It is recommended that do not use the SA user for ZENworks database access.

        `username=password`

        The password will be encrypted automatically when you restart the ZENworks services.
     2. `dmmappings.properties` located in `/etc/opt/novell/zenworks/datamodel` on Linux and `ZENworks_installation_path\conf\datamodel` on Windows.

        If you have changed the ZEN user name, then update `readonly` and `superuser` fields. If you have changed audit user, then change the `audit` field.
2. Restart the ZENworks services.
   - **On Windows:**
     1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
     2. Double-click **Administrative Tools** > **Services**.
     3. Start the following services: **Novell ZENworks Server**, **Novell ZENworks services Monitor**, and **Novell ZENworks Agent Service**.
   - **On Linux:** At the console prompt, enter the following commands:
     - `/etc/init.d/novell-zenmntr restart`
     - `/etc/init.d/novell-zenserver restart`
     - `/etc/init.d/novell-zenloader restart`

3 Start the ZENworks services on all other ZENworks Servers in the Management Zone.

On Windows:

1. Execute the following command at the server prompt:

   `novell-zenworks-configure -c Start`

2. Enter the number next to the `Start` action.

On Linux:

1. Execute the following command at the server prompt:

   `/opt/novell/zenworks/bin/novell-zenworks-configure -c Start`

2. Enter the number next to the `Start` action.

19 Configuring the ZENworks Server to Point to the New Oracle Database Containing Data Moved from Another Oracle Database

If you move the data from one Oracle database to another Oracle database, the Windows or Linux ZENworks Server must be configured to point to the new Oracle database.

The following sections provide detailed information:

- "Preparing to Move the Data" on page 101
- "Configuring the ZENworks Server to Point to the New Oracle Database" on page 102

Preparing to Move the Data

Before configuring the server to point the new Oracle database, do the following:

- Ensure that the ZENworks Server is configured to an Oracle database. The database can be installed on the ZENworks Server or on a different device. Assume that the device that currently host the Oracle database is called ORDB1.
- Ensure that you have another Windows device with an Oracle database installed with the same database credentials as the ORDB1. Assume that this device is called ORDB2. For more information on how to install an Oracle database, for Windows, see "Installing an External ZENworks Database" for Linux, see "Installing an External ZENworks Database" in the *ZENworks Server Installation Guide*.
- Move the data from ORDB1 to ORDB2. For more information about moving the data, see the Oracle database documentation.
- Stop the ZENworks services on the ZENworks Servers in the Management Zone.
  - **On Windows:**
    1. Execute the following command at the server prompt:

       ```
       novell-zenworks-configure -c Start
       ```
    2. Enter the number next to the `Stop` action.
  - **On Linux:**
    1. Execute the following command at the server prompt:

       ```
       /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
       ```
    2. Enter the number next to the `Stop` action.

Configuring the ZENworks Server to Point to the New Oracle Database

To configure the ZENworks Primary Server to point to the new Oracle database (ORDB2), perform the following tasks on the ZENworks Primary Server:

1. Take back up, and edit the `zdm.xml` and edit `zenaudit.xml` files (located in *`ZENworks_installation_path`*`\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux) to do the following:
   - Ensure that the value of the `Port` entry key is the port number on which the Oracle database is running.
   - Set the value of the `Server` entry key to the IP address of the ORDB2 device.
   - Set the value of the `Database` entry key to net service name of the Oracle database installed on the ORDB2 device.
2. Start the ZENworks services on all the ZENworks Servers in the Management Zone.
   - **On Windows:**
     1. Execute the following command at the server prompt:

        ```
        novell-zenworks-configure -c Start
        ```
     2. Enter the number next to the `Start` action.
   - **On Linux:**
     1. Execute the following command at the server prompt:

        ```
        /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
        ```
     2. Enter the number next to the `Start` action.

ZENworks Server should now point to the new database.

20 Migrating the Data from an External Sybase SQL Anywhere to an MS SQL Database

ZENworks allows you migrate the data from an external Sybase database to an MS SQL database installed on a device that does not have ZENworks installed.

Review the following to migrate the database:

- "Preparing to Move the Data" on page 103
- "Migrating the Data from the External Sybase Database to an MS SQL Database" on page 104
- "Post-Migration Tasks" on page 107

Preparing to Move the Data

Before migrating the data from the Sybase database to the MS SQL database, do the following:

- Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- Ensure that the Primary Server to which the Sybase database is configured has been upgraded to ZENworks.
- Ensure that the MS SQL database is installed on a device that does not have ZENworks installed.
- (Conditional) If you want to create a new database on MS SQL Server, and migrate the Sybase data into the new database, you must be aware of the database administrator credentials.
- (Conditional) If you want to migrate the data to an existing database that resides on the MS SQL server in your network, the newly created user must be assigned the db_owner database role and you must procure the database credentials of the newly created user from the database administrator.
- Manually stop the ZENworks services running on all other ZENworks Servers in the Management Zone.
  - **On Windows:**
    1. Execute the following command at the server prompt:

       `novell-zenworks-configure -c Start`
    2. Enter the number next to the `Stop` action.
  - **On Linux:**
    1. Execute the following command at the server prompt:

       `/opt/novell/zenworks/bin/novell-zenworks-configure -c Start`
    2. Enter the number next to the `Stop` action.

- Ensure that the Novell ZENworks Embedded Datastore service on the Primary Server is running.
  - **On Windows:**
    1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
    2. Double-click **Administrative Tools** > **Services**.
    3. Ensure that the status of the **Novell ZENworks Embedded Datastore** service is **Started**.
  - **On Linux:** At the console prompt, enter
    - `/etc/init.d/sybase-asa status` on SLES 11.
    - `systemctl status sybase-asa.service` on SLES 12.
- Ensure that the Novell ZENworks Embedded Datastore for auditing service on the Primary Server is running.
  - **On Windows:**
    1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
    2. Double-click **Administrative Tools** > **Services**.
    3. Ensure that the status of the **Novell ZENworks Embedded Datastore For Auditing** service is **Started**.
  - **On Linux:** At the console prompt, enter
    - `/etc/init.d/sybase-audit-asa status` on SLES 11.
    - `systemctl status sybase-audit-asa.service` on SLES 12.
- (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, do the following in the `novell-zenworks-configure.properties` file:
  1. Set the value of `Logger.logLevel` to the appropriate message type.

     For example, if you want messages of the type Finest to be logged:

     ```
     #Logger.logLevel   = FINEST
     ```

  2. Uncomment the line by removing the "#" as follows:

     ```
     Logger.logLevel   = FINEST
     ```

  The `novell-zenworks-configure.properties` file is located in *%ZENWORKS_HOME%*`\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

Migrating the Data from the External Sybase Database to an MS SQL Database

- "Migrating the Data from the External Sybase Database to an MS SQL Database" on page 105
- "Resuming the Database Migration" on page 106

Migrating the Data from the External Sybase Database to an MS SQL Database

1. Ensure that all the tasks listed in "Preparing to Move the Data" on page 103 are completed.
2. Run the database migration utility.
   - **On the Windows Primary Server:** At the command prompt, go to *ZENworks_installation_path*\bin\, then enter the following command:

     ```
     novell-zenworks-configure.bat -c DBMigrateConfigureAction
     ```
   - **On the Linux Primary Server:** At the console prompt, go to /opt/novell/zenworks/bin, then enter the following command:

     ```
     novell-zenworks-configure -c DBMigrateConfigureAction
     ```
3. Select the target database type as sql-server.
4. Choose the purging option for data before database migration.
5. Enter the IP address or host name of the MS SQL database server.
6. Enter the port used by the MS SQL database server.
7. (Optional) Enter the named instance for the MS SQL Server engine.
8. Choose to create a new database or use an existing database that resides on the MS SQL server.

   If you choose to create a new database, continue with Step 9.

   If you choose to use an existing database, skip to Step 10.
9. (Conditional) If you choose to create a new database in Step 8, perform the following tasks:

   9a Select the authentication type (Windows or SQL Server) to be used for the database administrator user.

   9b Enter the database server administrator user name.

   9c Enter the database server administrator password.

   9d (Conditional) If you choose Windows authentication in Step 9a, enter the database administrator's domain name.
10. Select the authentication type (Windows or SQL Server) to be used for the database access user.
11. Enter the database access user name.
12. Enter the database access user password.
13. (Conditional) If you choose Windows authentication in Step 10, enter the database access user's domain name.
14. Enter the database name of the database that resides on the MS SQL server to which you want to migrate the data. If you choose to create a new database in Step 8, the database is created on the MS SQL server with the name that you specify in this step.
15. (Conditional) If you choose to create a new database in Step 8, enter the complete path where you want the database to be created.
16. Perform the steps from Step 5 to Step 15 for ZENworks audit database. The database migration starts.

17 When the database migration is complete, you can verify the `novell-zenworks-configure.log` file to see if the migration was successful. The log file is located in *%ZENWORKS_HOME%*`\log\` on the Windows Primary Server and in `/var/opt/novell/log/zenworks/` on the Linux Primary Server.

18 After the database is successfully migrated, continue with the following steps:

   18a Perform post-migration tasks. See "Post-Migration Tasks" on page 107.

   18b Re-configure the ZENworks Reporting Server to point to the MS SQL database, because it will still be pointing to the Sybase database.

Resuming the Database Migration

If the migration of the database is stopped for any reason, the ZENworks migration utility allows you to resume the migration if the `dbmigration.xml` file has been created. The file is located in the *%ZENWOKS_HOME%*`\bin` directory on the Windows Primary Server, and in the `/opt/ novell/zenworks/bin` directory on the Linux Primary Server.

1 Run the database migration utility.

   - **On the Windows Primary Server:** At the command prompt, go to *ZENworks_installation_path*`\bin\`, then enter the following command:

     ```
     novell-zenworks-configure.bat -c DBMigrateConfigureAction
     ```

   - **On the Linux Primary Server:** At the console prompt, go to `/opt/novell/zenworks/bin`, then enter the following command:

     ```
     novell-zenworks-configure -c DBMigrateConfigureAction
     ```

2 Enter the target database type as sql database server.

3 Enter the IP address or host name of the MS SQL database server.

   You must specify the IP address or host name of the MS SQL database server used while migrating the database. For example, if you had specified the IP address of the database server while migrating the database, then you must specify the same IP address while resuming the database migration. You cannot specify the host name of the database server.

4 (Optional) Enter the named instance of the MS SQL Server engine.

5 Choose to use an existing database.

6 Enter the credentials of the database user depending on the authentication mode selected.

7 Enter the database name.

8 Choose to resume the database migration.

   The database migration starts.

9 After the database is successfully migrated, continue with "Post-Migration Tasks" on page 107.

Post-Migration Tasks

If there is only one server in the Management Zone, all ZENworks services are automatically started after the data is successfully migrated to an MS SQL Server database.

If there are multiple servers in the Management Zone:

1. On the device where you ran the migration utility, copy the following files to the appropriate directory on all the servers:

   `zdm.xml`
   `dmaccounts.properties`
   `dmmappings.properties`
   `zenaudit.xml`
   `zenaudit_dmaccounts.properties`

   The files are located in the *%ZENWORKS_HOME%*`\conf\datamodel` directory on Windows and in the `/etc/opt/novell/zenworks/datamodel` directory on Linux.

   Ensure that you run `permissions.sh` script located at `/opt/novell/zenworks/bin` on the Linux server after copying the above listed files.

2. Start all the ZENworks services on all the ZENworks Servers in the Management Zone.
   - **On Windows:**
     1. Execute the following command at the server prompt:

        ```
        novell-zenworks-configure -c Start
        ```

     2. Enter the number next to the `Start` action.
   - **On Linux:**
     1. Execute the following command at the server prompt:

        ```
        /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
        ```

     2. Enter the number next to the `Start` action.

The ZENworks Server now points to the new database.

NOTE: Ensure not to delete the ZENworks Sybase database files if you want to revert to using ZENworks Sybase database at a later time.

---

21 Migrating 32-bit OEM Sybase database to 64-bit Sybase on a 64-bit machine

1. Stop the OEM Sybase database service on the source machine (32-bit).
2. Use the ZENworks media on the 64-bit machine and start the OEM Sybase database installation by using the following command:
   - **Windows:** `setup.exe -c`
   - **Linux:** `setup.sh -c`
3. Select OEM Sybase as the **Database Type**.
4. Select the default path for a 64-bit machine as the database path for the **Directory**. If you select any other path, the OEM database installation fails.

   The default paths are as follows:
   - **32-bit machine:** `Program Files/Novell/ZENworks`
   - **64-bit machine:** `Program Files (x86)/Novell/ZENworks`

   If a non-default port and path are used for the OEM database installation on the source machine (32-bit), it is recommended to select the same path structure on the 64-bit machine as well.

   If a default port and path are used for the OEM database installation on the source machine (32-bit), it is recommended to select the same path structure on the 64-bit machine as well.
5. Enter the OEM database details (**Database Name**, **Database Engine Name**, **Database Server Name**, and **Port**). This information should be the same as that of the 32-bit OEM Sybase database, except for the IP address of the 32-bit machine, which will be changed after the OEM database installation on the 64-bit machine.
6. Stop the Sybase service on the 64-bit machine
7. Take a backup of the database folder from the 32-bit machine (includes the OEM Sybase database file) and replace the database file on the 64-bit machine with the backed-up (32-bit) database file.
8. Verify whether the CONF file on the 64-bit machine is updated with the proper OEM database path and port number respectively.

   NOTE: There is no need to replace the CONF file, as a fresh install of the OEM database is done on the 64-bit machine using the same database credentials as that of the 32-bit machine.

   ---
9. Disable the network card on the 32-bit machine.
10. Configure the 32-bit machine's IP address, subnet mask, default gateway, preferred DNS, host name and DNS suffix on the 64-bit machine.
11. Reboot the 64-bit machine.

22 Creating External PostgreSQL Database Schema

To create external or Remote OEM PostgreSQL schema, perform the following:

1. Insert or mount the ZENworks 2017 installation ISO on the server where you want to install the Remote OEM or External PostgreSQL database.
2. Open the command prompt and run the following command:
   1. **On Windows:** `setup.exe -c`
   2. **On Linux:** `setup.sh -c`
3. In the Select the database to be configured page, select ZENworks Database, Audit Database or both, and then click Next.
4. In the Select Database type page, select Remote OEM or External PostgreSQL database.
5. Specify the following for both the ZENworks and Audit databases:
   - Server Name
   - Port Number
   - Database Name
   - User Name
   - Password

23 Migrating the Data from an External Sybase Database to an External PostgreSQL Database

You can use the new Database Migration tool, or ZENworks 2020 installer to migrate the Sybase database to the PostgreSQL database. For more information, see Sybase to PostgreSQL Migration.

The migration tool can be downloaded from the ZENworks 2020 download site.

NOTE: Ensure that you download 2.0 (`db-migration-tool-2.0.zip`) or higher version.

---

24 Migrating the Data from an Oracle Database to an MS SQL Database

ZENworks allows you migrate the data from an Oracle database to an MS SQL database installed on a device that does not have ZENworks installed.

Review the following to migrate the database:

- "Preparing to Move the Data" on page 115
- "Migrating the Data from the Oracle Database to an MS SQL Database" on page 116

Preparing to Move the Data

Before migrating the data from the Oracle database to the MS SQL database, do the following:

- Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- Ensure that the Primary Server to which the Oracle database is configured has been upgraded to the latest version of ZENworks.
- Ensure that the MS SQL database is installed on a device that does not have ZENworks installed.
- (Conditional) If you want to create a new database on MS SQL Server, and migrate the Oracle data into the new database, you must be aware of the database administrator credentials.
- (Conditional) If you want to migrate the data to an existing database that resides on the MS SQL server in your network, the newly created user must be assigned the db_owner database role and you must procure the database credentials of the newly created user from the database administrator.
- Manually stop the ZENworks services running on all other ZENworks Servers in the Management Zone. Run `novell-zenworks-configure -c Start` and choose the ZENworks services to stop.
- Ensure that the Oracle database that is hosting the ZENworks and Audit databases are running.
- (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, do the following in the `novell-zenworks-configure.properties` file:
  1. Set the value of `Logger.logLevel` to the appropriate message type.

     For example, if you want messages of the type Finest to be logged:

     ```
     #Logger.logLevel   = FINEST
     ```

2. Uncomment the line by removing the "#" as follows:

   ```
   Logger.logLevel    = FINEST
   ```

The `novell-zenworks-configure.properties` file is located in *%ZENWORKS_HOME%*`\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

Migrating the Data from the Oracle Database to an MS SQL Database

- "Preparing to Move the Data" on page 116
- "Migrating the Data from the Oracle Database to an MS SQL Database" on page 117
- "Resuming the Database Migration" on page 118
- "Post-Migration Tasks" on page 119

Preparing to Move the Data

Before migrating the data to the MS SQL database, do the following:

- Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- Ensure that the MS SQL database is installed on a device that does not have ZENworks installed.
- (Conditional) If you want to create a new database on MS SQL Server, you must be aware of the database administrator credentials.
- (Conditional) If you want to migrate the data to an existing database that resides on the MS SQL server in your network, the newly created user must be assigned the db_owner database role and you must procure the database credentials of the newly created user from the database administrator.
- Manually stop the ZENworks services running on all other ZENworks Servers in the Management Zone.

  Stop the ZENworks services on all other ZENworks Servers in the Management Zone.

  - **On Windows:**
    1. Execute the following command at the server prompt:

       ```
       novell-zenworks-configure -c Start
       ```

    2. Enter the number next to the `Stop` action.
  - **On Linux:**
    1. Execute the following command at the server prompt:

       ```
       /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
       ```

    2. Enter the number next to the `Stop` action.
- (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, do the following in the `novell-zenworks-configure.properties` file:
  1. Set the value of `Logger.logLevel` to the appropriate message type.

For example, if you want messages of the type Finest to be logged:

```
#Logger.logLevel   = FINEST
```

2. Uncomment the line by removing the "#" as follows:

```
Logger.logLevel   = FINEST
```

The `novell-zenworks-configure.properties` file is located in *%ZENWORKS_HOME%*`\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

Migrating the Data from the Oracle Database to an MS SQL Database

1. Ensure that all the tasks listed in "Preparing to Move the Data" on page 116 are completed.
2. Run the `novell-zenworks-configure -c migration_new.DBMigration` database migration utility.
3. Select the target database type as sql-server.
4. Choose the purging option for data before database migration.
5. Enter the IP address or host name of the MS SQL database server.
6. Enter the port used by the MS SQL database server.
7. (Optional) Enter the named instance for the MS SQL Server engine.
8. Choose to create a new database or use an existing database that resides on the MS SQL server.

   If you choose to create a new database, continue with Step 9.

   If you choose to use an existing database, skip to Step 10.
9. (Conditional) If you choose to create a new database in Step 8, perform the following tasks:
   - **9a** Select the authentication type (Windows or SQL Server) to be used for the database administrator user.
   - **9b** Enter the database server administrator user name.
   - **9c** Enter the database server administrator password.
   - **9d** (Conditional) If you choose Windows authentication in Step 9a, enter the database administrator's domain name.
10. Select the authentication type (Windows or SQL Server) to be used for the database access user.
11. Enter the database access user name.
12. Enter the database access user password.
13. (Conditional) If you choose Windows authentication in Step 10, enter the database access user's domain name.
14. Enter the database name of the database that resides on the MS SQL server to which you want to migrate the data. If you choose to create a new database in Step 8, the database is created on the MS SQL server with the name that you specify in this step.
15. (Conditional) If you choose to create a new database in Step 8, enter the complete path where you want the database to be created.
16. Perform the steps from Step 5 to Step 15 for ZENworks audit database. The database migration starts.

17 When the database migration is complete, you can verify the `novell-zenworks-configure.log` file to see if the migration was successful. The log file is located in *%ZENWORKS_HOME%*`\log\` on the Windows Primary Server and in `/var/opt/novell/log/zenworks/` on the Linux Primary Server.

18 After the database is successfully migrated, continue with the following steps:

   18a Perform post-migration tasks. See "Post-Migration Tasks" on page 119.

   18b Re-configure the ZENworks Reporting Server to point to the MS SQL database, because it will still be pointing to the Oracle database.

Resuming the Database Migration

If the migration of the database is stopped for any reason, the ZENworks migration utility allows you to resume the migration if the **DBMigration.xml** and **AuditDBMigration.xml** files for ZENworks and Audit databases has been created. The file is located in the *%ZENWOKS_HOME%*`\bin` directory on the Windows Primary Server, and in the `/opt/novell/zenworks/bin` directory on the Linux Primary Server.

1 Run the database migration utility.

   - **On the Windows Primary Server:** At the command prompt, go to *ZENworks_installation_path*`\bin\`, then enter the following command:

     ```
     novell-zenworks-configure.bat -c DBMigrateConfigureAction
     ```

   - **On the Linux Primary Server:** At the console prompt, go to `/opt/novell/zenworks/bin`, then enter the following command:

     ```
     novell-zenworks-configure -c DBMigrateConfigureAction
     ```

2 Enter the target database type as sql database server.

3 Enter the IP address or host name of the MS SQL database server.

   You must specify the IP address or host name of the MS SQL database server used while migrating the database. For example, if you had specified the IP address of the database server while migrating the database, then you must specify the same IP address while resuming the database migration. You cannot specify the host name of the database server.

4 (Optional) Enter the named instance of the MS SQL Server engine.

5 Choose to use an existing database.

6 Enter the credentials of the database user depending on the authentication mode selected.

7 Enter the database name.

8 Perform from Step 1 to Step 7 for audit database migration.

9 Choose to resume the database migration.

   The database migration starts.

10 After the database is successfully migrated, continue with "Post-Migration Tasks" on page 119.

Post-Migration Tasks

If there is only one server in the Management Zone, all ZENworks services are automatically started after the data is successfully migrated to an MS SQL Server database.

If there are multiple servers in the Management Zone:

1. On the device where you ran the migration utility, copy the following files to the appropriate directory on all the servers:

   `zdm.xml`
   `dmaccounts.properties`
   `dmmappings.properties`
   `zenaudit.xml`
   `zenaudit_dmaccounts.properties`

   The files are located in the *%ZENWORKS_HOME%*`\conf\datamodel` directory on Windows and in the `/etc/opt/novell/zenworks/datamodel` directory on Linux.

   Ensure that you run `permissions.sh` script located at `/opt/novell/zenworks/bin` on the Linux server after copying the above listed files.

2. Start all the ZENworks services on all the ZENworks Servers in the Management Zone.

The ZENworks Server now points to the new database.

25 Migrating the data from an MS SQL Server to a PostgreSQL Database

You can use the new Database Migration tool to migrate an MS SQL Server to a PostgreSQL database. For more information, see MS SQL to PostgreSQL Migration.

The migration tool can be downloaded from the ZENworks 2020 download site.

NOTE: Ensure that you download 2.0 (`db-migration-tool-2.0.zip`) or higher version.

III Database Management - Best Practices, Tips, Troubleshooting

This section includes some tips and best practices for database management:

- Chapter 26, “Database Ports,” on page 125
- Chapter 27, “Database Best Practices,” on page 127
- Chapter 28, “Database Tips,” on page 131
- Chapter 29, “Troubleshooting Database Migration,” on page 139

26 Database Ports

Following are the default ZENworks database ports:

Port Number	Description
1433	Default port to connect with the MS SQL database. Based on your configuration, the port number might vary.
1521	Default port to connect with the Oracle database. Based on your configuration, the port number might vary.
2638 and 2639	Default port to connect with the Embedded and Remote OEM Sybase database.
54327	Default port to connect with the Embedded and Remote OEM PostgreSQL database.

27 Database Best Practices

This documentation provides instructions to rebuild the Sybase database by using the DBISQL utility. You can choose to rebuild and validate the database by using any other utility that is recommended in the Sybase SQL Anywhere documentation.

- "Rebuilding the Sybase Database" on page 127

Rebuilding the Sybase Database

If your ZENworks database is an embedded or external Sybase database, you should rebuild the database so that it runs on the latest version of the Sybase database engine.

1. Ensure that you have archived your database credentials.

   To archive the credentials of an external Sybase database, contact your database administrator.

   To archive the credentials of an embedded or external OEM Sybase database, perform the following tasks on the database server:

   1a. Ensure the database service is running.

   On Windows: In the Windows Services, ensure that the status of **Novell ZENworks Embedded Datastore** is *Started*.

   On Linux: At the console prompt,

   - To verify the status of the database, enter:
     - `/etc/init.d/sybase-asa status` on SLES 11.
     - `systemctl status sybase-asa.service` on SLES 12.
   - If the database is not running, then enter:
     - `/etc/init.d/sybase-asa start` on SLES 11.
     - `systemctl start sybase-asa.service` on SLES 12.

   1b. Obtain the Sybase connection information by running the `zman dgc` command.

   1c. Provide the credentials of the ZENworks administrator when prompted.

   1d. Copy and save the database user name and password into a text file.

2. Stop the Novell ZENworks Embedded Datastore service, if it is running.

   - **On Windows:** Do the following:
     1. From the **Start** menu, click **Settings** > **Control Panel**.
     2. Double-click **Administrative Tools** > **Services**.
     3. Right-click the **Novell ZENworks Embedded Datastore** service, then click **Stop**, or select the **Novell ZENworks Embedded Datastore** service, then click ■ on the toolbar.
   - **On Linux:** At the console prompt, enter
     - `/etc/init.d/sybase-asa stop` on SLES 11.
     - `systemctl stop sybase-asa.service` on SLES 12.

3 Stop the ZENworks services on all other ZENworks Servers in the Management Zone. For more information, see Step 2a on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

4 At the console prompt, go to the Sybase database directory. By default, it is `%ZENWORKS_HOME%\database` on Windows, and `/var/opt/novell/zenworks/database` on Linux.

5 Take a reliable backup of the `zenworks_zone_name.db` and `Zenworks_zone_name.log` files.

For detailed information on how to take an immediate backup of the files of the embedded Sybase database, see Section 3, "Backing Up the Embedded Sybase SQL Anywhere Database," on page 15. For detailed information on how to take an immediate backup of the files of the external Sybase database, see Section 12, "Backing Up the External Sybase Database," on page 65.

6 Start the Novell ZENworks Embedded Datastore service.

- **On Windows:** Perform the following:
  1. From the Windows desktop **Start** menu, click **Settings** > **Control Panel**.
  2. Double-click **Administrative Tools** > **Services**.
  3. Right-click the **Novell ZENworks Embedded Datastore** service, then click **Start**, or select the **Novell ZENworks Embedded Datastore** service, then click ▶ on the toolbar.
- **On Linux:** At the console prompt, enter
  - `/etc/init.d/sybase-asa start` on SLES 11.
  - `systemctl start sybase-asa.service` on SLES 12.

7 (Conditional) If your database is installed on Linux, run the following script file:

```
source /opt/novell/zenworks/share/sybase/bin32/sa_config.sh
```

8 Ensure that the database authentication has been set up by verifying that the `database_authentication` attribute in the `saopts.sql` file has been configured.

The `saopts.sql` file is located in the `%ZENWORKS_HOME%\share\asa\scripts\` directory on Windows, and in the `/opt/novell/zenworks/share/sybase/scripts/` directory on Linux. The `database_authentication` attribute is located in the following entry in the `saopts.sql` file:

```
if not exists( select * from SYS.SYSOPTION
 where ucase( "option" )  = ucase( 'database_authentication' ) ) then
    set option PUBLIC.database_authentication = <value>;
end if
go
```

If the value of `set option PUBLIC.database_authentication` is empty or does not exist in the script, continue with Step 8a to launch the DBISQL utility and to configure the database authentication; else skip to Step 9.

8a Launch the DBISQL utility. For more information, see Step 1 on page 65 in the "Backing Up the External Sybase Database on a Windows or Linux Server" on page 65.

8b In the **SQL Statements** section, specify the following query:

```
select setting
from sysoptions
   where "option" like 'database%' >># output_filename
```

8c Click **Execute SQL Statement(s)**.

The results of the query are written in the output file that you specify in the query.

8d Copy the result of the query from the output file, and paste it as the value of the `database_authentication` attribute in the `saopts.sql` file. The `saopts.sql` file is located in the `%zenworks_home%\share\asa\scripts\` directory on Windows, and in the `/opt/novell/zenworks/share/sybase/scripts/` directory on Linux.

The `database_authentication` attribute is located in the following entry in the `saopts.sql` file:

```
if not exists( select * from SYS.SYSOPTION
 where ucase( "option" )  = ucase( 'database_authentication' ) )
then
    set option PUBLIC.database_authentication =
<output_of_the_query_run_in_Step_8b>;
end if
go
```

9 Stop the Novell ZENworks Embedded Datastore service.

- **For the Embedded Database:** Stop the ZENworks services, including the Novell ZENworks Embedded Datastore service:
  1. At the console prompt, run the `novell-zenworks-configure -c Start` command.
  2. Type the option number corresponding to Stop.
  3. Press Enter twice.
- **For the External Database:** Stop the Novell ZENworks Embedded Datastore Service by stopping the Windows Services manager on Windows, or by running the `/etc/init.d/sybase-asa stop` command on Linux.

10 Open another command prompt on the database server, and run the dbunload command. ZENworks Database services must be stopped at this point.

Run the appropriate command:

On Windows:

```
<ZENWORKS_HOME>\share\ASA\BIN64\dbunload.exe -c
"UID=zenadmin;PWD=password;DBF=<ZENWORKS_HOME>\database\zenworks_<Zone
Name>.db" -ar -ap 4096 -ii -et"
```

On Linux:

```
/opt/novell/zenworks/share/sybase/bin64s/dbunload -c
"UID=zenadmin;PWD=password;DBF=/var/opt/novell/zenworks/database/
zenworks_<ZoneName>.db" -ar -ap 4096 -ii -et"
```

where *ZENWORKS_HOME* is the folder path that is selected during installation, and *ZoneName* is the name that is specified in the Zone Name field during installation.

This will rebuild the original database and replace the files with the new files.

11 After the database rebuild has been successfully completed, take a reliable backup of the newly built database. The database is located in the `c:\dbreload\unload` directory on Windows and in the `/tmp/dbreload/unload` directory on Linux.

If you encounter any issues during the rebuild process, contact Novell Support (http://www.novell.com/support).

12 Stop the Novell ZENworks Embedded Datastore service by using the dbeng12 command:

- **On Windows:** Right-click the **Rebuild** icon located in Windows taskbar, then click **Shutdown**.
- **On Linux:** At the console prompt, enter q.

13 Overwrite the database and applicable log file in the database directory with the new ones located in the `unload` directory (`zenworks_management_zone_name.*`).

The `unload` directory is located in `c:\dbreload\` on Windows or in `/tmp/dbreload/` on Linux.

14 Start the Novell ZENworks Embedded Datastore service.

- **For the Embedded Database:** Start all the ZENworks services, including the Novell ZENworks Embedded Datastore service:
  1. At the console prompt, run the `novell-zenworks-configure -c Start` command.
  2. Type the option number corresponding to Start.
  3. Press Enter twice.
- **For the External Database:** Start the Novell ZENworks Embedded Datastore service in the Services window on Windows, or run the `/etc/init.d/sybase-asa start` command on Linux.

15 Start the ZENworks services on the ZENworks Servers in the Management Zone. For more information, see Step 2c on page 16 in the "Backing Up the Embedded Sybase SQL Anywhere Database on a Windows or Linux Server" on page 15.

16 Take a backup of the newly created database on a regular basis (daily or weekly).

28 Database Tips

- "Changing the ZENworks Database User Password" on page 131
- "Changing the Backup Location and Schedule of the Embedded Sybase Database Subsequent to the Initial Backup" on page 132
- "Changing the Backup Schedule and Location of the External Sybase Database Subsequent to the Initial Backup" on page 133
- "Reverting to the ZENworks Sybase Database from the ZENworks Oracle Database" on page 135
- "Identifying the EBF Version of Sybase Database Server" on page 136
- "Maximum Pool Size" on page 136
- "Verifying Invalid Objects and Indexes in the Oracle Database" on page 136

Changing the ZENworks Database User Password

Use system administrator or user with DBA privileges to execute the below commands. For Embedded sybase, `zenadmin` or `zenauditadmin` user has DBA privileges.

Before changing the password ensure that you shutdown all Primary Servers and Reporting Server.

- **For SQL Anywhere or Oracle:** After you log into SQL Anywhere or Oracle database run the below SQL statement to change the password for existing user.

  ```
  ALTER USER <<username>> IDENTIFIED BY <<new password>>
  ```

- **For Microsoft SQL Server:** Users with SQL Server authentication, might run the below SQL statement to change the password for existing user.

  ```
  ALTER LOGIN <<username>> WITH PASSWORD = 'new password' OLD_PASSWORD =
  'old password'
  ```

  User with Windows authentication, might change the Windows user account password and no changes required in SQL Server.

After changing the database user password, perform the following steps to change the password in all the Primary Servers:

1. Go to the following path;
   - **On Windows:** `C:\Program Files (x86)\Novell\ZENworks\conf\datamodel`
   - **On Linux:** `/etc/opt/novell/zenworks/datamodel`
2. Back up the `dmaccounts.properties` and `zenaudit_dmaccounts.properties` files.
3. Open the `dmaccounts.properties` and `zenaudit_dmaccounts.properties` files.
4. Change the existing password that is in encrypted form.

   For example, the existing value is `ZENWORKS=@OB@6a7278626bba`

   and the changed value is `ZENWORKS=<<new password>>`

IMPORTANT: Do not encrypt the new password. The new password is encrypted automatically when you restart the ZENworks services.

Changing the Backup Location and Schedule of the Embedded Sybase Database Subsequent to the Initial Backup

Review the following sections:

- "Changing the Backup Location of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup" on page 132
- "Changing the Backup Schedule of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup" on page 133

Changing the Backup Location of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup

To change the backup location of the embedded Sybase SQL Anywhere database subsequent to its initial backup:

1. Delete the existing database backup schedule by executing the following command at the Primary Server command prompt:

   `zman db` *`current_database_backup_location`* `DropSchedule.sql`

   `Dropschedule.sql` is located by default in the `ZENworks_Installation_directory:\Novell\Zenworks\share\zman\samples\database` directory on a Windows server, and in the `/opt/novell/zenworks/share/zman/samples/database` directory on a Linux server.

2. Enter the following command to back up the database to a new location:

   `zman database-backup` *`complete_path_of_the_new_database_backup_directory complete_path_of_the_database_backup_schedule_file`* `-d` *`SQL_function_call`*

   For example, to back up the database to the `c:\dbbackup\newdbbackups` directory on a Windows server according to the database backup schedule specified in the `c:\backUpschedule.sql`, enter the following command:

   `zman database-backup c:\dbbackup\newdbbackups c:\backUpSchedule.sql -d` *`SQL_function_call`*

   For more information about this command, view the zman man page (man zman) on the device, or see zman(1) in the *ZENworks Command Line Utilities Reference*.

Changing the Backup Schedule of the Embedded Sybase SQL Anywhere Database Subsequent to the Initial Backup

To change the backup schedule of the embedded Sybase SQL Anywhere database subsequent to its initial backup:

1. Create a schedule file with the Alter Event content:

   ```
   ALTER EVENT backup_schedule_name
   SCHEDULE
   START TIME specify_the_schedule
   ```

   For example, you could use the `Alterschedule.sql` file to back up the database at a 11:00 p.m. on Monday, Tuesday, and Wednesday of every week as follows:

   ```
   ALTER EVENT ZENDBBackup
   SCHEDULE
   START TIME '11:00 PM'
   ON ('Monday', 'Tuesday', 'Wednesday')
   ```

   A sample `Alterschedule.sql` file is available in the `ZENworks_Installation_directory:\Novell\Zenworks\share\zman\samples\database` directory on a Windows server, and in the `/opt/novell/zenworks/share/zman/samples/database` directory on a Linux server.

2. Enter the following command to back up the database according to the new schedule:

   ```
   zman database-backup complete_path_of_the_database_backup_directory
   complete_path_of_the_modified_database_backup_schedule_file -d
   SQL_function_call
   ```

   For example, to back up the database to the `c:\dbbackup\` directory on a Windows server according to the database backup schedule specified in the `c:\AlterSchedule.sql`, enter the following command:

   ```
   zman database-backup c:\dbbackup\ c:\AlterSchedule.sql -d
   SQL_function_call
   ```

   For more information about this command, view the zman man page (man zman) on the device, or see zman(1) in the *ZENworks Command Line Utilities Reference*.

Changing the Backup Schedule and Location of the External Sybase Database Subsequent to the Initial Backup

To change the backup location and the backup schedule of the external Sybase database subsequent to its initial backup, perform the following tasks on the device that has the external Sybase database installed and running:

1. Launch the DBISQL utility. For more information, see Step 1 on page 65 in the "Backing Up the External Sybase Database on a Windows or Linux Server" on page 65.

2 Change the database backup schedule and the backup location as required.

You can use the same SQL query to change the database backup schedule and the backup location. You can change the backup schedule and the location at the same time or at a different time.

```
ALTER EVENT
name_of_the_existing_backup_schedule_event_containing_the_database_bac
kup_schedule_or_location_that_you_want_to_change

SCHEDULE

new_database_backup_schedule or existing_backup_schedule

HANDLER

BEGIN

BACKUP DATABASE DIRECTORY
'complete_path_of_the_existing_database_backup_location or
complete_path_of new_database_backup_location'

TRANSACTION LOG TRUNCATE

END;
```

If you want to back up the database to a directory on Windows, you must use \\ (double backslash) as the delimiter while specifying the database backup directory path

For example, assume that you have database backup event, `zendbbackup`, that locally backs up the database to `c:\dbackup` at 1:00 a.m. every day. If you want to change the database backup schedule or location, review the following:

- If you want to back up the database at 11:00 p.m. on Monday, Wednesday, and Friday of every week, change the database backup schedule in the `zendbbackup` event by executing the following query in the DBISQL utility:

  ```
  ALTER EVENT zendbbackup

  SCHEDULE

  '11:00 PM' ON ('Monday', 'Wednesday', 'Friday')

  HANDLER

  BEGIN

  BACKUP DATABASE DIRECTORY 'c:\\dbbackup'

  TRANSACTION LOG TRUNCATE

  END;
  ```

- If you want to back up the database to a new location, such as `e:\zendb\dbbackup`, change the database backup location in the `zendbbackup` event by executing the following query in the DBISQL utility:

  ```
  ALTER EVENT zendbbackup

  SCHEDULE

  '1:00 AM' EVERY 24 HOURS
  ```

```
HANDLER
BEGIN
BACKUP DATABASE DIRECTORY 'e:\\zendb\\dbbackup'
TRANSACTION LOG TRUNCATE
END;
```

- If you want to back up the database at 2:00 a.m. on the first, second, and third day on the month to a new location, `e:\zendb\dbbackup`, change the database backup schedule and location in the `zendbbackup` event by executing the following query in the DBISQL utility:

```
ALTER EVENT zendbbackup
SCHEDULE
'2:00 AM' EVERY 24 HOURS ON (1,2,3)
HANDLER
BEGIN
BACKUP DATABASE DIRECTORY 'e:\\zendb\\dbbackup'
TRANSACTION LOG TRUNCATE
END;
```

Reverting to the ZENworks Sybase Database from the ZENworks Oracle Database

ZENworks allows you migrate the data from an internal or external Sybase database to an Oracle database installed on a device that does not have ZENworks installed.You can revert to ZENworks Sybase database at a later time if you have retained the ZENworks Sybase database files after migrating the data to Oracle.

To revert to ZENworks Sybase database, perform the following tasks:

1. On the device where you run the migration utility, rename the following files:

   `zdm.xml.bak` to `zdm.xml`
   `zenaudit.xml.bak` to `zenaudit.xml`
   `dmaccounts.properties.bak` to `dmaccounts.properties`
   `dmmappings.properties.bak` to `dmmappings.properties`

   The files are located in the *`ZENworks_installation_path`*`\conf\datamodel` directory on Windows and in the `/etc/opt/novell/zenworks/datamodel` directory on Linux.

2. Restart the ZENworks services on the ZENworks Servers in the Management Zone.
   - **On Windows:** Do the following
     1. Execute the following command at the server prompt:

```
novell-zenworks-configure -c Start
```

2. Enter the number next to the `Restart` action.

- **On Linux:** Do the following:
  1. Execute the following command at the server prompt:

     ```
     /opt/novell/zenworks/bin/novell-zenworks-configure -c Start
     ```

  2. Enter the number next to the `Restart` action.

Identifying the EBF Version of Sybase Database Server

To know the version of the EBF that is installed and running on the Sybase database server, run the `dblocate` utility. The utility is located in the `%ZENWORKS_HOME%\share\ASA\BIN32` directory on a Windows database server and in the `/opt/novell/zenworks/share/sybase/bin32s` directory on a Linux database server.

Maximum Pool Size

The MaxPoolSize value configured in the `zdm.xml` file governs the maximum number of connections allowed in a database connection pool from a Primary Server.

The `zdm.xml file` is located on the Primary Server:

Windows: `%ZENWORKS_HOME%\conf\datamodel\`

Linux: `/etc/opt/novell/zenworks/datamodel/`

With the default MaxPoolSize value of 100, the ZENServer and ZENLoader services currently create a single thread pool. As a result, under the peak load, there are 100 possible connections each from ZENloader and ZENserver.

However, the database server should be able to accept and serve 200*<*N*> concurrent connections from the ZENworks context, where *N* is the number of Primary Servers in the ZENworks Zone.

The current default value is sufficient for most configurations and loads. It is recommended not to customize the MaxPoolSize value; to closely monitor the database, functionality and performance of ZENworks.

If you want to configure a higher value for the MaxPoolSize parameter, ensure that the number of concurrent connections that can be accepted or served by the database server is greater than or equal to 2*<*Configured MaxPoolSize*> * <*Number of Primary Servers*>.

NOTE: The default MinPoolSize value is 5.

Verifying Invalid Objects and Indexes in the Oracle Database

To verify if there are any Invalid objects and Indexes in ZENworks Control Center that uses the Oracle database for ZENworks or Audit schema, run the following queries:

NOTE

- Do NOT use SQuirreL

```
SELECT * FROM USER_OBJECTS WHERE STATUS='INVALID';SELECT * FROM
USER_INDEXES WHERE FUNCIDX_STATUS='DISABLED';SELECT * FROM USER_INDEXES
WHERE STATUS='INVALID';SELECT * FROM USER_IND_PARTITIONS WHERE STATUS NOT
IN ('N/A','USABLE');SELECT * FROM USER_IND_SUBPARTITIONS WHERE STATUS NOT
IN ('USABLE');SELECT * FROM USER_CONSTRAINTS WHERE STATUS!='ENABLED';
```

The above queries should NOT return any records.If these queries return any records, you need to run the below scripts in the respective schema:

```
DECLARE V_CNT NUMBER;BEGIN SELECT COUNT(1) INTO V_CNT FROM USER_OBJECTS
WHERE STATUS ='INVALID' AND OBJECT_TYPE IN
('PROCEDURE','TRIGGER','FUNCTION','VIEW'); WHILE V_CNT > 0 LOOP FOR REC IN
(SELECT * FROM USER_OBJECTS WHERE STATUS ='INVALID' AND OBJECT_TYPE IN
('PROCEDURE','TRIGGER','FUNCTION','VIEW') ) LOOP BEGIN EXECUTE IMMEDIATE
'ALTER '||REC.OBJECT_TYPE||' "'||REC.OBJECT_NAME||'" COMPILE'; EXCEPTION
WHEN OTHERS THEN NULL; END; END LOOP; SELECT COUNT(1) INTO V_CNT FROM
USER_OBJECTS WHERE STATUS ='INVALID' AND OBJECT_TYPE IN
('PROCEDURE','TRIGGER','FUNCTION','VIEW'); END LOOP;END;/DECLARE V_CNT
NUMBER;BEGIN SELECT COUNT(1) INTO V_CNT FROM USER_INDEXES WHERE
FUNCIDX_STATUS='DISABLED' AND TEMPORARY ='N' AND INDEX_TYPE! ='LOB' AND
PARTITIONED ='NO' AND TABLE_NAME IN (SELECT TABLE_NAME FROM USER_TABLES
WHERE TEMPORARY='N' ) AND TABLE_NAME NOT IN
('PLAN_TABLE','ZENUPGRADELOG','ZENUPG_INDEX'); WHILE V_CNT > 0 LOOP FOR REC
IN (SELECT * FROM USER_INDEXES WHERE FUNCIDX_STATUS='DISABLED' AND
TEMPORARY ='N' AND INDEX_TYPE! ='LOB' AND PARTITIONED ='NO' AND TABLE_NAME
IN (SELECT TABLE_NAME FROM USER_TABLES WHERE TEMPORARY='N' ) AND TABLE_NAME
NOT IN ('PLAN_TABLE','ZENUPGRADELOG','ZENUPG_INDEX') ) LOOP EXECUTE
IMMEDIATE 'ALTER INDEX '||REC.INDEX_NAME||' ENABLE'; END LOOP; SELECT
COUNT(1) INTO V_CNT FROM USER_INDEXES WHERE FUNCIDX_STATUS='DISABLED' AND
TEMPORARY ='N' AND INDEX_TYPE! ='LOB' AND PARTITIONED ='NO' AND TABLE_NAME
IN (SELECT TABLE_NAME FROM USER_TABLES WHERE TEMPORARY='N') AND TABLE_NAME
NOT IN ('PLAN_TABLE','ZENUPGRADELOG','ZENUPG_INDEX'); END LOOP;END;/BEGIN
FOR REC1 IN (SELECT * FROM USER_INDEXES WHERE PARTITIONED='YES' AND
TABLE_NAME IN (SELECT TABLE_NAME FROM USER_TABLES WHERE TEMPORARY='N') AND
TABLE_NAME NOT IN ('PLAN_TABLE','ZENUPGRADELOG','ZENUPG_INDEX')) LOOP IF
REC1.STATUS='N/A' THEN FOR REC2 IN (SELECT * FROM USER_IND_PARTITIONS WHERE
INDEX_NAME=REC1.INDEX_NAME AND STATUS! ='USABLE') LOOP IF REC1.STATUS='N/A'
THEN FOR REC3 IN (SELECT * FROM USER_IND_SUBPARTITIONS WHERE INDEX_NAME
=REC2.INDEX_NAME AND PARTITION_NAME=REC2.PARTITION_NAME AND STATUS!
='USABLE' ) LOOP EXECUTE IMMEDIATE 'ALTER INDEX '||REC3.INDEX_NAME||'
REBUILD SUBPARTITION '||REC3.SUBPARTITION_NAME; END LOOP; ELSE EXECUTE
IMMEDIATE 'ALTER INDEX '||REC2.INDEX_NAME||' REBUILD PARTITION
'||REC2.PARTITION_NAME; END IF; END LOOP; END IF; END LOOP; FOR REC IN
(SELECT * FROM USER_INDEXES WHERE FUNCIDX_STATUS!='ENABLED' ) LOOP EXECUTE
IMMEDIATE 'ALTER INDEX '||REC.INDEX_NAME||' ENABLE'; END LOOP;END;/
```

Verify the invalid objects after executing above scripts. The following queries should NOT return any records:

```
SELECT * FROM USER_OBJECTS WHERE STATUS='INVALID';SELECT * FROM
USER_INDEXES WHERE FUNCIDX_STATUS='DISABLED';SELECT * FROM USER_INDEXES
WHERE STATUS='INVALID';SELECT * FROM USER_IND_PARTITIONS WHERE STATUS NOT
IN ('N/A','USABLE');SELECT * FROM USER_IND_SUBPARTITIONS WHERE STATUS NOT
IN ('USABLE');SELECT * FROM USER_CONSTRAINTS WHERE STATUS!='ENABLED';
```

29 Troubleshooting Database Migration

- "After database migration ZEUS is unable to contact the new database server" on page 139
- "During Appliance deployment, configuring External PostgreSQL using the New Schema option fails to create Audit database" on page 140
- "Error message 404 is displayed when you log into the ZENworks Control Center" on page 140
- "Troubleshooting a Java Heap Space Exception" on page 140
- "Troubleshooting an Oracle Database Crash" on page 141
- "Troubleshooting an Oracle Tablespace Issue" on page 141
- "Troubleshooting the Database Migration Failure Issue" on page 142
- "Troubleshooting the Database Migration by Using An Existing User Schema" on page 142
- "Troubleshooting the ORA-01652: unable to extend temp segment by 128 in tablespace TEMP" on page 143
- "Troubleshooting the ORA-01400: cannot insert NULL" on page 143
- "Troubleshooting the ORA-12516, TNS: listener could not find available handler with matching protocol stack" on page 143
- "Troubleshooting the database migration failure, duplication of serial numbers in the zDevice table" on page 144

After database migration ZEUS is unable to contact the new database server

If you have added the database.conf file to override the default JDBC URL and drivers values. After database migration, the content of the database.conf file might not be updated with the latest database information. Hence, ZEUS might not be able to contact the new database server.

Workaround:

By default, the details in the `ZDM.xml` file is used to communicate between database server and ZEUS. If you want to override the default JDBC driver class and JDBC URL values, then updated the database.conf file with the new database information.

To use the default values for driver class and JDBC URL, delete the database.conf, else value in this file will be used to communicate with ZEUS.

The database.conf file is available in the following location:

On Windows: `%ZEN_HOME%\ZeUS\conf\`

On Linux: `/etc/opt/novell/zenworks/ZeUS/conf/`

During Appliance deployment, configuring External PostgreSQL using the New Schema option fails to create Audit database

While deploying the ZENworks 2017 Appliance, if you configure external PostgreSQL as the database (ZENworks and Audit) using the New Schema option, then the Audit database might not be created.

Workaround: Create a PostgreSQL database schema and then deploy the appliance. During the appliance deployment, configure the external PostgreSQL database using the Existing Schema option.

For more information on creating PostgreSQL schema, see the "Creating External PostgreSQL Database Schema" on page 111 section.

Error message 404 is displayed when you log into the ZENworks Control Center

Issue: Using the database migration tool, when you migrate from embedded Sybase to MS SQL, configured with a named instance, the migration is successful, but a 404 error message is displayed when you log into ZENworks Control Center.

Action:

1. Stop the *zenserver* and *zenloader* services.
2. Remove the port entry tag from the `zdm.xml` and `zenaudit.xml` files.
3. Restart the services.

Troubleshooting a Java Heap Space Exception

If you encounter a Java heap space exception during the database migration because of low memory:

1. Edit the *`ZENworks_installation_path`*`\bin\novell-zenworks-configure.bat` file on Windows or `/opt/novell/zenworks/bin/novell-zenworks-configure` on Linux to change the heap space value in the following line, depending upon the RAM of the device where the migration utility is running:

   ```
   "%JAVA_HOME%\bin\java" -Djava.library.path=%ZENLIB% -cp "%MYCP%"
   %DEBUG_OPTS% %JAVA_OPTS% -Xmx1024m
   com.novell.zenworks.configure.ConfigureLoader %CONFIG_OPTS%
   ```

   The heap space value is represented in megabytes (MB) within `-Xmx1024m`. By default, it is `1024`.

   For example, if the RAM of the device is 2048 MB, then the line in the `novell-zenworks-configure.bat` file can be updated as follows:

   ```
   "%JAVA_HOME%\bin\java" -Djava.library.path=%ZENLIB% -cp "%MYCP%"
   %DEBUG_OPTS% %JAVA_OPTS% -Xmx2048m
   com.novell.zenworks.configure.ConfigureLoader %CONFIG_OPTS%
   ```

IMPORTANT: The heap space value must be either equivalent to or less than the RAM of the device. It is recommended to have a minimum 2048 MB to continue with database migration.

2 At the console prompt, run the *ZENworks_installation_path*\bin\novell-zenworks-configure.bat file on Windows or /opt/novell/zenworks/bin/novell-zenworks-configure on Linux.

3 Follow the prompts.

When you are prompted to enter the location of the file required for resuming the migration, enter the the complete path of DBMigration.xml. The file is located in the *ZENworks_installtion_path*\bin directory on Windows, and in the /opt/novell/zenworks/bin directory on Linux.

The XML file contains a list of tables and a flag indicating whether the table was successfully migrated or not. When the database migration resumes, only the tables with flag value set to False are migrated.

Troubleshooting an Oracle Database Crash

If the Oracle database crashes during the database migration:

1 At the console prompt, run the *ZENworks_installation_path*\bin\novell-zenworks-configure.bat file on Windows or /opt/novell/zenworks/bin/novell-zenworks-configure on Linux.

2 Follow the prompts.

When you are prompted to enter the location of the file required for resuming the migration, enter the complete path of DBMigration.xml. The file is located in the *ZENworks_installtion_path*\bin directory on Windows, and in the /opt/novell/zenworks/bin directory on Linux.

The XML file contains a list of tables and a flag indicating whether the table was successfully migrated or not. When the database migration resumes, only the tables with flag value set to False are migrated.

IMPORTANT: Do not edit the contents of DBMigration.xml.

Troubleshooting an Oracle Tablespace Issue

If the Oracle USERS tablespace does not have sufficient space to create and store the ZENworks database schema, the database migration fails with the following error messages while trying to create the tables:

```
SEVERE: Terminating the database migration.
SEVERE: An error has occurred while migrating the database.
```

To resolve this issue, perform the following:

- The Oracle database administrator must increase the size of the USERS tablespace.

- Ensure that the tablespace has a minimum of 100 MB to create ZENworks database schema without any data in it.
- Ensure to have some extra space depending upon the size of the database to be migrated.

Troubleshooting the Database Migration Failure Issue

If the NLS_CHARACTERSET parameter is not set to AL32UTF8 and the NLS_NCHAR_CHARACTERSET parameter is not set to AL16UTF16, the database migration fails with the following error messages:

```
Failed to run the sql script: localization-updater.sql,
message:Failed to execute the SQL command: insert into
zLocalizedMessage(messageid,lang,messagestr)
values('POLICYHANDLERS.EPE.INVALID_VALUE_FORMAT','fr','La stratÃ©gie {0}
n''a
pas pu Ãªtre appliquÃ©e du fait que la valeur de la variable "{1}" n''est
pas
dans un format valide.'),
message:ORA-00600: internal error code, arguments: [ktfbbsearch-7], [8],
[],
[], [], [], [], []
```

To resolve the issue of database migration failure:

- Set the NLS_CHARACTERSET parameter to AL32UTF8 and the NLS_NCHAR_CHARACTERSET parameter to AL16UTF16..
- Ensure that the character set parameters are configured with the recommended values, run the following query at the database prompt:

  ```
  select parameter, value from nls_database_parameters where parameter
  like '%CHARACTERSET%';
  ```

Troubleshooting the Database Migration by Using An Existing User Schema

If you choose to migrate the database by using an existing user schema, the database migration utility creates the ZENworks database but it might fail to migrate the data.

To resolve this issue:

1. Ensure that the ZENworks tables, views, and user sequence are deleted from the newly created ZENworks database by the database administrator. Later on, clear the `user_recyclebin` database table.
2. Start the database migration again by using the same user schema.

   To start the migration from an internal Sybase to the Oracle database, see "Migrating the Data from the Internal Sybase Database to an Oracle Database" on page 45. To start the migration from an external Sybase to the Oracle database, see "Migrating the Data from the External Sybase Database to an Oracle Database" on page 87.

Troubleshooting the ORA-01652: unable to extend temp segment by 128 in tablespace TEMP

The **ORA-01652: unable to extend temp segment by 128 in tablespace TEMP** error appears, when the temp tablespace have default size and the current transaction involves more number of records with `clob` data type.

To troubleshoot this scenario, perform either of the following or both:

1. Add extra `dbf` file for temp tablespace.
2. Reduce the number of records for the transaction (For Database Migration if you are using default batch size 10,000 that can be reduced to 100 or 500 or 1000 based on the nature of each record having clob data.).

IMPORTANT: For better performance depending on the database size and resource availability, you can increase the `batchsize` in the `db-migration-mssql-to-oracle.properties` file. It is located in *%ZENWORKS_HOME*`%\novell\zenworks\conf\` on Windows and in `/etc/opt/novell/zenworks/conf/` on Linux.

Troubleshooting the ORA-01400: cannot insert NULL

The **cannot insert NULL** error appears, when you are migrating MS SQL to Oracle database.

To troubleshoot this scenario, perform the following:

1. Go to the `database-table-column-mapping.properties` file located at the following path:
   - **For Windows:** `%ZENWORKS_HOME%\Novell\ZENworks\conf`
   - **For Linux:** `/etc/opt/novell/zenworks/conf`
2. Open the `database-table-column-mapping.properties` file.
3. Append the Table name, Column, and the Replacement value according to the the `database-table-column-mapping.properties` file format.

IMPORTANT: If you donot provide a replacement value, then it will take an empty character as a replacement value.

Troubleshooting the ORA-12516, TNS: listener could not find available handler with matching protocol stack

The **TNS: listener could not find available handler with matching protocol stack** error appears, when you are migrating MS SQL to Oracle database.

To troubleshoot this scenario, increase the oracle processes by using the below SQL statement and bounce the database to reflect the changes.

```
SQL> alter system set processes=500 scope=spfile
```

Troubleshooting the database migration failure, duplication of serial numbers in the zDevice table

In the ZENworks database on the Microsoft SQL server, if the unique constraint is not created on the serial number column of the zDevice table, duplicate serial numbers might be assigned to the devices that are connected to the Management Zone. Because of the duplicate serial numbers, the database migration from the Microsoft SQL database to the Oracle database might fail.

To identify and remove the duplicate serial number in the zDevice table, perform the following steps in the Microsoft SQL database:

1. Use the following query to identify the duplicate serial numbers in the Microsoft SQL database:

   ```
   SELECT * FROM zDevice WHERE serialnumber IN (SELECT serialnumber FROM
   zDevice GROUP BY serialnumber HAVING COUNT(1) > 1)
   ```

2. If the duplicate serial numbers are found on the zDevice table, do one of the following:
   - Remove the device from the Management Zone and register the device again.
   - Modify the duplicate serial numbers so that each serial number is unique.

To resume the database migration, perform the following in the Oracle database:

1. Use the following query to identify the duplicate serial numbers in the Oracle database:

   ```
   SELECT * FROM zDevice WHERE serialnumber IN (SELECT serialnumber FROM
   zDevice GROUP BY serialnumber HAVING COUNT(1) > 1)
   ```

2. Run the following SQL query to remove the duplicate entry from the target Oracle database:

   ```
   begin
   for rec in (select zuid from zDevice where serialnumber is null)
   loop
   update zDevice
   set serialnumber=NVL(serialnumber,'_')||'_'||dbms_random.string('U',
   10)
   where zuid=rec.zuid;
   commit;
   end loop;
   for rec in (select serialnumber from zDevice group by serialnumber
   having count(1) > 1)
   loop
   update zDevice
   set serialnumber=serialnumber||'_'||dbms_random.string('U', 10)
   where serialnumber=rec.serialnumber;
   commit;
   end loop;
   ```

3. If there are any duplicate serial numbers, run the following query to verify.

If there are any duplicate numbers, run `select serialnumber from zDevice group by serialnumber having count(1) > 1;` and remove the duplicate serial numbers.

If there are no duplicates serial numbers, resume with the migration process.

NOTE: It is recommends that you clean up the duplicate serial numbers data before starting the database migration. You can continue to use the existing Management Zone without any loss functionality.