IBM® Netezza® Analytics
Release 3.2.x.0

Administrator's Guide

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Note: Before using this information and the product that it supports, read the information in Notices and Trademarks on page 55.

Contents

3 Database and User Configuration

4 Data Set Configuration

5 Netezza Cartridge Manager Reference

List of Tables

Preface

Audience for This Guide

The guide is intended for administrators who need to install, reinstall, configure, and maintain IBM Netezza Analytics or packages related to it. To best use the guide, you should be familiar with the basic operation and concepts of the IBM Netezza appliance, the NPS, and IBM Netezza Analytics.

Purpose of This Guide

This guide includes instructions for installing, uninstalling, and registering components of the IBM Netezza Analytics package. It also includes information related to setting proper database permissions to support operation of IBM Netezza Analytics and its packages, such as the Netezza Spatial or Spatial ESRI Package, and IBM Netezza Analytics documentation. Finally, it provides information on acquiring, configuring, and adding sample data used in the documentation examples.

Symbols and Conventions

Note on Terminology: The terms *User-Defined Analytic Process (UDAP)* and *Analytic Executable (AE)* are synonymous.

The following conventions apply:

- Italics for emphasis on terms and user-defined values, such as user input.
- Uppercase for SQL commands, for example, INSERT or DELETE.
- Bold for command line input, for example, **`nzsystem stop`**.
- Bold to denote parameter names, argument names, or other named references.
- Angle brackets (< >) to indicate a placeholder (variable) that should be replaced with actual text, for example, **`inza-<version>.zip`**.
- A single backslash (“\”) at the end of a line of code to denote a line continuation. Omit the backslash when using the code at the command line, in a SQL command, or in a file.
- When referencing a sequence of menu and submenu selections, the “>” character denotes the different menu options, for example, **Menu Name > Submenu Name > Selection**.

If You Need Help

If you are having trouble using the IBM Netezza appliance, IBM Netezza Analytics or any of its components:

1. Retry the action, carefully following the instructions in the documentation.
2. Go to the IBM Support Portal at: http://www.ibm.com/support. Log in using your IBM ID and password. You can search the Support Portal for solutions. To submit a support request, click the '**Service Requests & PMRs**' tab.
3. If you have an active service contract maintenance agreement with IBM, you may contact customer support teams via telephone. For individual countries, please visit the Technical Support section of the IBM Directory of worldwide contacts (http://www14.software.ibm.com/webapp/set2/sas/f/handbook/contacts.html#phone)

Comments on the Documentation

We welcome any questions, comments, or suggestions that you have for the IBM Netezza documentation. Please send us an e-mail message at netezza-doc@wwpdl.vnet.ibm.com and include the following information:

- The name and version of the manual that you are using
- Any comments that you have about the manual
- Your name, address, and phone number

We appreciate your comments.

CHAPTER 1
Installing or Upgrading IBM Netezza Analytics

Overview

The IBM Netezza product is comprised of a number of different packages, which together provide a suite of tools that can be used to implement a wide range of analytical activities. The decision regarding which packages need to be installed depends on the functionality required.

This section provides instructions for performing a standard IBM Netezza Analytics installation. To perform a manual installation, refer to the section Using nzcm for Advanced Package Management.

System Requirements

For information about the hardware and software requirements, see the document System requirements for IBM Netezza Analytics Version 3.0.

Downloading the Installation Files

The download location for the IBM Netezza Analytics installation files depends on whether you are downloading a major release (for example, 2.0, 2.5, or 3.0) or a patch release (for example, 2.0.4 or 2.5.2).

- Major releases can be downloaded from either Passport Advantage or Fix Central. The downloadable is a tar file (for example, CID0WEN.tar.z).
- Patch releases are downloaded from Fix Central.

Downloading from Passport Advantage

To download the IBM Netezza Analytics installation files from Passport Advantage:

1. Sign in to Passport Advantage using your IBM credentials: http://www-01.ibm.com/software/howtobuy/passportadvantage/
2. Search for the IBM Netezza Analytics software package.
3. Download the appropriate package according to the accompanying download instructions.
4. Extract the contents from the tar file. For example, CID0WEN.tar.z.

Downloading from Fix Central

To download the IBM Netezza Analytics installation files from Fix Central:

1. Sign in to Fix Central using your IBM credentials: http://www-933.ibm.com/support/fixcentral/
2. Search for the IBM Netezza Analytics software package.
3. Download the wanted components according to the accompanying download instructions.

Files Contained in the Download

Both the major release package and the patch release package contain the following files:

- IBM_Netezza_Analytics_Administrators_Guide.pdf
- IBM_Netezza_Analytics_Release_Notes.pdf
- **nz-analytics-v<version>.zip** file of approximately 700MB to 1000 MB in size that contains the following files:
  - **inza-<version>.zip** file
    A secondary zip file that contains all the components that are required for IBM Netezza Analytics
  - **inzaPackageInstaller.sh**

The installation script

- verifyNpsVersion
  A verification tool

- **nz-analyticsdoc-v<version>.zip**
  - All IBM Netezza Analytics documentation in Adobe® PDF format of approximately 20 MB in size.
- **nz-analyticsdochtml-v<version>.zip**
  - All IBM Netezza Analytics documentation in HTML format of approximately 15 MB in size.

Downloading the Files

Download the files for the corresponding release to your host machine. The recommended location is a directory named **/nz/var/inza**, which you may need to create. However, the files can be placed in any location.

Notes:

- The **nz-analytics-v<version>.zip** file must remain on the appliance host.
- The **nz-analyticsdoc-v<version>.zip** file must remain on the appliance host if you are installing it by using the provided install script. Otherwise, you can move it to a local machine.
- The remaining downloaded files can be transferred to a local machine.

Product Installation

Note: The **nz-analytics-v<*version*>.zip** file contains the product package, the installer, and a verification tool. However, it is the extracted file, **inza-<*version*>.zip**, that is used for the product installation.

The **inzaPackageInstaller.sh** script simplifies the installation process by automating installation of the various component packages and registering the installed packages, if needed. The script provides the option of installing the entire IBM Netezza Analytic product, including the IBM Netezza Analytics documentation in Adobe PDF format[1], or of installing only selected components.

Note: The installation script uses only the **inza-<*version*>.zip** file and the **inzadoc-v<*version*>.zip** file.

The first portion of the installation process extracts and installs the Netezza Cartridge Manager (nzcm), which is then leveraged to install the remaining IBM Netezza Analytics packages. For more information on manual installation using the Netezza Cartridge Manager, refer to the section Using nzcm for Advanced Package Management.

Note that if the installation script is used, it is not necessary to manually uninstall previous installations, as the script performs that task.

1 The IBM Netezza Analytics documents are available in both Adobe® PDF and HTML formats. Note that the installation script installs only the PDF versions. The PDF and HTML files are contained in the inzadoc-<version>.zip and inzadochtml-<version>.zip files, respectively.

Netezza Analytics and Netezza Replication Services

Prerequisites:

Before you start installing Netezza Analytics in an existing replication environment, ensure that the following prerequisites are met.

1. You must install the same Netezza Analytics cartridges and the same versions on all nodes.
2. If Netezza Analytics is already installed on one or more subordinate nodes, you must uninstall it before you install the Netezza Analytics package on the subordinate nodes.
3. You must ensure that the state of the master node and of the subordinate nodes is not *suspended* or *suspending*.

When you install Netezza Analytics in an existing replication environment, do the following steps:

1. Install the Netezza Analytics package on all subordinate nodes.
   The installation program automatically detects that the configuration of these nodes is a subordinate configuration.

   Only the required files are installed; databases are not created.
2. After the installation on all subordinate nodes is completed, install the Netezza Analytics package on the master node.

   A full installation is done. The Netezza Analytics databases are created with the configured replication set so that they are replicated to the subordinate nodes as read-only databases.
3. After the installation on the master node is completed, do the following steps on the subordinate nodes:
   a. Go to the */nz/export/ae/utilities/bin* directory.
   b. Run the following command:
   ./inzaSubordinateInstaller.sh

   The installation of Netezza Analytics in an existing replication environment is completed.

Cartridge Manager and Documentation Installation

To start installing the Netezza Analytics package by using the script, do the following steps:

1. Unzip the file **nz-analytics-v<*version*>.zip**.

   Note: You must use the **unzip** utility to unzip the file; **gunzip** cannot be used.
2. Ensure that the active user on the host is **nz**.
3. From the command line, run the installation script by using the following command:

   ```
   ./inzaPackageInstaller.sh
   ```
4. The installer runs the **verifyNpsVersion** tool to check whether the version to install is compatible with the NPS release of the system. You receive a message only if there is an

inconsistency, for example:

```
Kit version 7.0.D1 is less than min 7.0.F0
```

5. If Netezza Analytics is already installed on the Netezza appliance, the script provides a notification and prompts to determine whether to remove the current installation or exit.

```
A previous installation of Netezza Analytics was found on your appliance.
This installation of Netezza Analytics will be removed before the new
packages are installed. During the removal, the inza, nza, nzm, nzrc, and
nzr databases will be dropped. Additionally, all objects in these
databases, including those objects that were created manually, will be
removed permanently.
Do you want to proceed? (Y/N):
```

6. Enter **Y** to remove the current installation or **N** to exit without changes.

   If you Enter **Y**, the script unregisters and uninstalls any Netezza Analytics packages that are installed. The script shows a number of status messages for progress information. In addition, log files that document the process are generated and saved to */nz/var/log/*.

7. After all existing installations are removed, the script starts with the installation. Press **Enter** to install the packages as described, or press any other key, and then follow the prompts to change the selections.

```
Do you want to install the Netezza Analytics packages? (Y/N): Y

Do you want to install the documentation packages? (Y/N): Y

Confirm that the following packages should be installed.
1) Netezza Analytics package: YES
2) Netezza Analytics documentation package: YES
Do you want to install the selected packages?
Enter "Y" to continue, "X" to exit, or any other key to change
your selection: Y
```

   Note: These instructions assume that you are installing both packages.

8. If the selections are correct, press **Enter** to continue with the installation. The script searches for any installation files, and provides you with an option to install one of those files or to specify a different file. For example:

```
Installing Netezza Analytics packages...
Available compressed installation file or files:
  [0] /home/nz/inza-3.0.1.0.zip
  [1] /home/nz/inza-3.0.1.0.zip
  [2] A zipped file in a different directory or with a non-standard name.

Enter your selection:
```

   Note: If no Netezza Analytics package files are found, the script only offers to enter “A zipped file in a different directory...”

9. Select the number corresponding to the file that you want to install. Use the option [2] in the example above to specify a different file or location. When you use option [2], the script

prompts you for the location and file name. At the prompt, type the full path for the Netezza Analytics .zip file, including the file name. For example, to install release 3.0.1.0 from a backup directory, enter the following path:

```
/home/nz/backups/inza-3.0.1.0.zip
```

Important: The file that you specify must be the **inza-<*version*>.zip** file, not the **nz-analytics-v<*version*>.zip** file it was extracted from. The extracted file is required to correctly install the product.

10. The script extracts all of the files in the package and installs the Netezza Cartridge Manager (nzcm). The script shows a number of status messages for progress information.

11. **This step only applies if a previous version of Netezza Analytics was installed.**

    Once nzcm is installed, the script prompts you to verify that the repository configuration should be reset:

    ```
    Do you want to reset the repository configuration? (Y/N): Y
    ```

    Press **Enter** to reconfigure the repository configuration or enter **N** to keep the repository configuration and skip this step. Only enter **N** if the configuration was previously changed and the modifications must be kept. For more information about the nzcm Repository Configuration, see Repository Configuration.

    You may also want or need to make changes to the bashrc file. For example, by default nzcm points to **current**. If you want to point elsewhere, make this change in bashrc.

12. After the Netezza Cartridge Manager is installed and after the repository and .bashrc files are modified if required , the script proceeds to the documentation package installation.

    ```
    NZCM successfully installed.
    Installing  Netezza Analytics Documentation packages...

    Available zipped documentation files:
      [0] inzadoc—3.0.1.0.zip
      [1] inzadoc—3.0.1.0.zip
      [2] inzadochtml-3.0.1.0.zip
      [3] A zipped file in a different directory or with a non-standard name.

    Enter your selection:

    If you enter 3, type the full path to the documentation .zip file:
    ```

13. Select the number corresponding to the file that you want to install. Use the option [3] in the example above to specify a different file or location. When you use option [3], the script prompts you for the location and file name. At the prompt, type the full path for the documentation .zip file, including the file name. If no documentation files are found, the script only offers to enter “A zipped file in a different directory...”

    Note: If you intend to install both the PDF and HTML documentation, you must select only one type at this point. After the package installation is completed, start with the installation again, and at Step 7., select only the Documentation.

14. After you select an option, the script installs the documents from the zip file. If documents

from a previous installation exist in the destination directory, the script prompts you to determine if the current documents should be replaced or renamed.

For example:

```
Replace documentation/Netezza_Lua_Developers_Guide.pdf? [y]es, [n]o,
[A]ll, [N]one, [r]ename: r
```

15. Select the appropriate option, typically **Y** or **A**. If **r** is selected, the script prompts you for a new name, for example:

```
Replace documentation/Netezza_Lua_Developers_Guide.pdf? [y]es, [n]o,
[A]ll, [N]one, [r]ename: r
New name: documentation/Lua_Dev_Guide.pdf
```

Note: If the documents are renamed, they are not automatically replaced on subsequent installs.

The requested documents are then installed.

```
Documentation installation is complete.
The documentation files are in the following directory:
/home/nz/documentation
```

16. If you want to install the second type of documentation, HTML or PDF, depending on your first selection, return to Step 7. Then select **N** when you are asked whether to install the Netezza Analytics packages and **Y** when you are asked whether to install the documentation.
17. Continue from Step 12., and install the documentation as prompted.

Component Installation

Once the installation tasks found in the Cartridge Manager and Documentation Installation section are complete, the script prompts to determine whether to run nzcm, which installs and registers the individual components of the Netezza Analytics package. You will have an option to perform either a custom or express installation. The custom option allows you to install selected components within the packages, while the express option installs the entire package. The following is the prompt to run nzcm:

```
Would you like to run the IBM Netezza Analytics cartridge installer now?
(y/n):
```

1. Select **y** to run the IBM Netezza Analytics cartridge installer. The following prompt appears:

```
Would you like to perform an Express (e) or Custom (c) install (e/c):
```

Note: If you do not select either **e** or **c,** an error message appears, allowing you to exit the installer script.

2. For Custom installation, press **c**; for Express installation press **e**.
   a. If you select custom installation, the script prompts to verify installation of each component. The example below shows the four component prompts. In each case in the example, the user chose to install the component.

```
Install MapReduce components? (y/n): y
Install Matrix components?
   Note: Matrix components are also required for PCA, Kmeans, GLM
and Linear Regression. (y/n): y
Install IBM Netezza In-database Analytics components? (y/n): y
Install Spatial components? (y/n): y
Install ESRI Spatial (legacy spatial will be installed otherwise)?
(y/n): y
```

Once selections are made for each component, a prompt similar to the following example, but reflecting the actual selections, appears. Select **y** to install the packages as described, or select any other key, then follow the prompts to change the selections.

```
Please review the components to install:
 1) MapReduce: YES
 2) Matrix: YES
 3) IBM Netezza In-database Analytics: YES
 4) Spatial: YES (ESRI)
Do you wish to install the above selections?
   Enter "y" to continue, "x" to exit
   or any other key to be prompted to modify your selection:
```

The script provides a list of components to be installed, then outputs a number of status messages to provide information about the progress of the script. Note that the installation process may take some time. Once installed, the selected packages are automatically registered.

Unattended Installation

You can also run an unattended installation of the Netezza Analytics package by using the `inzaPackageInstaller.sh` script. An unattended installation does not require any user interaction.

Notes:

- This installation script always installs the latest version of the Netezza Analytics package or *.zip* file in the current directory.
- The installation script does not install the documentation; you must install the documentation manually.
- To keep the output for the unattended installation, you can redirect this output to a file.

To start the unattended installation by using a script, do the following steps:

1. Extract the *nz-analytics-v<version>.zip* file by using the **unzip** command.
   Note: You cannot use the **gunzip** command to extract this file.
2. Ensure that the active user on the host is **nz**.
3. To execute the installation script, enter the following command from the command line:
   `./inzaPackageInstaller.sh -s`

Results: Netezza Analytics is installed in the unattended installation mode. During this installation, all the default values are used.

Database Update

After the installation and registration of the components are completed, you are prompted with the following question:

```
Would you like to re-enable all databases that are enabled for Netezza
Analytics? (y/n): y
```

Enter **y** to re-enable these databases.

You get a list of all the databases that are re-enabled. If enabled Netezza Analytics system databases, such as NZA or NZM, are found, they are disabled. From Netezza Analytics V3, you can no longer enable these databases.

If you enter **n**, because you do not want to re-enable the databases now, you can manually re-enable the databases later. For more information about how to re-enable databases manually, see Updating User Databases.

Spatial Database Update

After the database update is completed or skipped, you are prompted with the following question:

```
Would you like to update all spatial databases that already have spatial
registered with the current version (y/n): y
```

Enter **y** to update the spatial version on all databases with the new spatial version that is being installed.

If nzspatial is registered on a database, the new version of nzspatial is registered after the update. If nzspatial_esri is registered on a database, the new version of nzspatial_esri is registered after the update. For each database that contains spatial, the current spatial version is shown. Required updates are also shown.

If you enter **n**, none of the databases on which spatial is registered are updated. You can update these spatial databases later by using the nzcm command.

Netezza Analytics Databases

Depending on the selections that you make during the installation, the following new databases are created:

- INZA
- NZA
- NZM
- NZR
- NZRC
- NZMSG

These databases contain the procedures and functions of the Netezza Analytics product. The databases also contain sample data. The data in these databases is contained in the INZA schema. The INZAUSER user is the owner of all these databases and their objects.

Notes:

- These databases are deleted when Netezza Analytics is upgraded.
- Do not grant login access to these databases to standard users.
- Do not create additional schemas or any other database objects in these databases.
- You cannot enable these databases for Netezza Analytics.
- Do not change the default schema of any of these databases. If you change any default schema, Netezza Analytics becomes unusable.

For more information about sample data sets, see Data Set Configuration.

For information about Netezza Analytics databases with regard to the Netezza Replication Services feature, see Netezza Analytics and Netezza Replication Services.

Product Upgrade

Upgrading the Netezza Analytics package uses the same steps as a standard install.

Important: If a previous installation of Netezza Analytics is found on the appliance, the installation process removes the earlier version before installing the new packages. When this happens, the inza, nza, nzm, and nzr databases are dropped, permanently removing all objects in those databases, including objects created by users.

Saving Database Changes before Upgrade

After you update and re-enable your user databases to Netezza Analytics V3.0, you cannot fall back to your previous version of Netezza Analytics. Therefore, back up all of the user databases before you start with the migration to Netezza Analytics 3.0. Thus, you can still work with these user databases if you decide to fall back to a previous version of Netezza Analytics, for example, V2.5.4.

Because an upgrade drops the inza, nza, nzm, and nzr databases, you may want to save changes made in these databases since the current IBM Netezza Analytics version was installed. Note that it is not recommended to make such changes in these databases because they are intended for storing the IBM Netezza Analytics code only, but if you have done so, follow these directions to save your data:

- To save the *analytic models*, create a new database and enable it for IBM Netezza Analytics by running the appropriate script(s) -- create_inza_db.sh, create_inza_db_admin.sh, create_inza_db_developer.sh, and create_inza_db_user.sh. Then, use the **COPY_MODEL** command to copy the wanted model or models into the new database. Do not copy these objects back to the original database because the original database is always deleted when you upgrade your Netezza Analytics version.
  Note: From Netezza Analytics V3, you can no longer enable the inza, nza, nzm, or nzr database for Netezza Analytics. Therefore, you cannot copy the models back to these databases.

- For *all other database objects*, you can copy them manually to another database by using the appropriate SQL commands. Alternatively, you can use the **backup** command to save a whole database and then restore it to a different name. In that case, you can also copy the database objects back to the original database after the upgrade. Be certain to adjust user and group privileges when you copy database objects. With this procedure, however, analytics models are not saved because restoring to a different database is not supported for databases that are enabled for Netezza Analytics versions previous to Netezza Analytics V3. You must use the procedure that is outlined in the first bullet.

Upgrading Netezza Analytics

You can upgrade Netezza Analytics in one of the following ways:

- Upgrade the existing version of Netezza Analytics by using the *inzaPackageInstaller.sh* script. This method is the preferred one.

- Uninstall the existing Netezza Analytics version by using the *uninstall_inza.sh* script, and then do a fresh installation of the new version by using the *inzaPackageInstaller.sh* script.
  Use this method if problems occur during the upgrade procedure. This method disables all the databases that are enabled for Netezza Analytics. You must re-enable these databases manually.

To upgrade the existing version of Netezza Analytics by using the *inzaPackageInstaller.sh* script, take the following steps:

1. Ensure that the system databases of Netezza Analytics are not in use, for example, by restarting NPS through `nzstop` and `nzstart`.
2. Ensure that the state of the node is not *suspended* or *suspending*.
3. Install the new version of Netezza Analytics by using the *inzaPackageInstaller.sh* script.
   - If the *inzaPackageInstaller.sh* script does not find dependencies and installs the new Netezza Analytics version, proceed with Step 4.
   - If the *inzaPackageInstaller.sh* script cannot uninstall the existing Netezza Analytics version because it finds dependencies between user objects and objects in Netezza Analytics system databases, do the following steps:
     a) Exit the script. The script then prints a list of all dependencies.
     b) Ensure that you know how to recreate these objects after the upgrade of Netezza Analytics, for example, by using one or more of the following methods:

        - From the Netezza Software Support package, use the nz_ddl tool to create the DDL statements for all databases that have dependencies on Netezza Analytics system databases. You can re-create the objects based on the output of nz_ddl.

        - If you have installed IBM Fluid Query, unregister your data connector

functions before Netezza Analytics upgrade and re-register them afterwards.

- If you have written your own functions that depend on Netezza Analytics, you might still have the code to compile and register these functions. You must, however, re-create the Lua functions by using *nzl*. The Lua library that is installed, typically changes in a new Netezza Analytics version.

- If database views depend on Netezza Analytics, you can read the view definitions from the catalog by using the following statement:
```
select viewschema, viewname, text from syscat.views
```

- For all objects that you re-create, check whether you also need to re-create user privileges, group privileges, or role privileges on these objects. The nz_ddl tool generates GRANT statements to re-create privileges.

c) Delete the dependent objects that reference objects in Netezza Analytics system databases.

d) Install the new version of Netezza Analytics again by using the *inzaPackageInstaller.sh* script and proceed with Step 4.

4. Verify whether the new version number of Netezza Analytics is correct in one of the following ways:
   - On the Linux command line, enter the following command:
     `nzcm –inza`
   - In a database, enter the following command:
     `select * from inza..product;`
5. Re-create the deleted dependent objects.

To uninstall the existing version of Netezza Analytics and then do a fresh installation, take the following steps:

1. Ensure that the system databases of Netezza Analytics are not in use, for example, by restarting NPS through `nzstop` and `nzstart`.
2. Ensure that the state of the node is not *suspended* or *suspending*.
3. Determine the databases and the users that are enabled for Netezza Analytics because you must re-enable them after the upgrade is completed.
   a. To determine the databases, enter the following command:
   ```
   select inzadb from (select substr(groupname, 1, length(groupname)-10)
   as inzadb from _v_group where upper(groupname) like '%_INZAUSERS') g
   inner join _v_database on inzadb = database;
   ```
   b. To determine the users that are enabled for Netezza Analytics, enter the following command:
   ```
   select username, groupname from _v_usergroups where username <>
   'INZAUSER' and (groupname like '%INZAUSERS' or groupname like
   ```

```
'%INZADEVELOPERS' or groupname like '%INZAADMINS');
```

The database is a prefix of the groupname. The postfix shows whether the user is enabled as *user*, *developer*, or *admin*.

4. Uninstall Netezza Analytics by using the */nz/var/nzcm/uninstall_inza.sh* script.
   - If the *uninstall_inza.sh* script does not find dependencies and uninstalls the new Netezza Analytics version, proceed with Step 5.
   - If the *uninstall_inza.sh* script cannot uninstall the existing Netezza Analytics version because it finds dependencies between user objects and objects in Netezza Analytics system databases, do the following steps:
     a) Exit the script. The script then prints a list of all dependencies.
     b) Ensure that you know how to recreate these objects after the upgrade of Netezza Analytics, for example, by using one or more of the following methods:
        - From the Netezza Software Support package, use the nz_ddl tool to create the DDL statements for all databases that have dependencies on Netezza Analytics system databases. You can re-create the objects based on the output of nz_ddl.
        - If you have installed IBM Fluid Query, unregister your data connector functions before Netezza Analytics upgrade and re-register them afterwards.
        - If you have written your own functions that depend on Netezza Analytics, you might still have the code to compile and register these functions. You must, however, re-create the Lua functions by using *nzl*. The Lua library that is installed, typically changes in a new Netezza Analytics version.
        - If database views depend on Netezza Analytics, you can read the view definitions from the catalog by using the following statement:
          ```
          select viewschema, viewname, text from syscat.views
          ```
        - For all objects that you re-create, check whether you also need to re-create user privileges, group privileges, or role privileges on these objects. The nz_ddl tool generates GRANT statements to re-create privileges.

     c) Delete the dependent objects that reference objects in Netezza Analytics system databases.
     d) Uninstall Netezza Analytics again by using the *uninstall_inza.sh* script and proceed with Step 5.
5. Verify that Netezza Analytics is uninstalled.
   If Netezza Analytics is uninstalled correctly, the following databases must no longer exist:
   - INZA
   - NZA

- NZM
- NZR
- NZRC
- NZVERIFY
- NZMSG

6. Install the new version of Netezza Analytics by using the *inzaPackageInstaller.sh* script.
7. Verify whether the new version number of Netezza Analytics is correct in one of the following ways:
   - On the Linux command line, enter the following command:
     ```
     nzcm –inza
     ```
   - In a database, enter the following command:
     ```
     select * from inza..product;
     ```
8. Re-enable the databases and users for Netezza Analytics by using these scripts:
   create_inza_db.sh
   create_inza_db_user.sh
   create_inza_db_developer.sh
   create_inza_db_admin.sh

   If create_inza_db.sh fails with the error message *Permission denied on "NZ_MAT_METADATA"*, or *DROP TABLE: permission denied*, or a similar error for a database, check whether the following tables are owned by INZAUSER:
   NZ_MAT_BRDCST_COMMAND
   NZ_MAT_METADATA
   NZA_META_MODELS
   NZA_META_COMPONENTS,
   NZA_META_PARAMS
   NZA_META_COLPROPS

   If these tables are owned by ADMIN, change the owner to INZAUSER by using the following command:
   ```
   alter table <table> owner to INZAUSER
   ```
   Then run the *create_inza_db.sh* script again.
9. Re-create the deleted dependent objects.

Updating and Re-enabling All User Databases after the Upgrade

After you upgrade your Netezza Analytics version to Version 3.0, you must update and re-enable all user databases that are enabled for Netezza Analytics.

Note: Skip these steps if you answered the question about re-enabling the databases with **Y** when you ran the installation script. All the databases are already enabled.

If a user database is not updated, analytic stored procedures produce the following error message:

```
NZAUT-0191E: The metadata tables must be migrated to a new version. Re-
initialize IBM Netezza Analytics by calling 'nza..initialize()'.
```

To update and re-enable all user databases, run the **update_inza_dbs.sh** script by doing the following steps:

1. Go to the **/nz/export/ae/utilities/bin** directory.
2. Enter the following command:
   ./update_inza_dbs.sh

Result: All user databases that are enabled for Netezza Analytics are now updated and re-enabled.

Note: This script does not change the components, that is tables, views, and matrices, of existing models. If the format of model components for an algorithm was changed in the current Netezza Analytics version, you get an error message when you use the model in a procedure that cannot process the old format. You are then asked to use the MIGRATE_MODEL procedure to convert the model to the latest format.

For more information about updates of user databases, see Updating User Databases.

Uninstalling Netezza Analytics

To uninstall Netezza Analytics, you can use the **uninstall_inza.sh** script in the **/nz/var/nzcm/** directory.

When you run the **uninstall_inza.sh** script, the uninstallation process is done as follows:

1. The script uninstalls Netezza Analytics by using nzcm to unregister and uninstall all inza group cartridges.
2. The script uninstalls the NZCM tool and removes NZCM-related entries in .bashrc. It also removes NZCM logs and temporary files.
3. The script drops the inza system databases that include nza, nzm, nzr, inza, and nzmsg.
4. You are asked if you want to delete the **/nz/export/ae** directory and the **/nz/extensions/nz** directory. Both directories contain Netezza Analytics installation files and application files. Deleting these directories ensures that no Netezza Analytics-related files remain in the system.
5. The script deletes nzevent actions for Netezza Analytics.
6. You are asked if you want to delete all crontab entries that are shown.
   - If you select **y**, all the crontab entries are removed.
   - If you select **n**, your crontab file in which you can modify your crontab entries opens.
7. The script drops the INZAUSER user and the INZA_ADMINS global group, the INZA_USERS global group, and the INZA_DEVELOPERS global group. The script also drops any per-database groups for databases that are enabled for Netezza Analytics.

CHAPTER 2
Database Backup and Restore

Overview

You can use the following commands for database backup and restore:

- **nzbackup** to create a full or incremental backup of databases
- **nzrestore** to restore these databases to the same or another Netezza system

You can use these commands also to back up and restore databases that are enabled for Netezza Analytics. You must, however, do additional steps to back up and restore the Netezza Analytics-specific data correctly. Netezza Analytics stores metadata about analytic models or matrices in each database; the additional steps are required to ensure that the metadata are correct and consistent after the restore operation.

Notes:

- You cannot use the **nzhostbackup** command and the **nzhostrestore** command to back up or restore Netezza Analytics metadata. These commands work only for host metadata, that is, the database catalog.
- You cannot use the **inzabackup** command and the **inzarestore** command to back up or restore databases that are enabled for Netezza Analytics. You can use these commands only to back up and restore files that are related to analytic executables. For more information, see the *User-Defined Analytic Process Developer's Guide.*

Backup

Netezza Analytics stores metadata about models and matrices in a set of tables that are created when you enable a database for Netezza Analytics.

Check the consistency of these tables before you do a full or incremental backup of the database.

To check the consistency and possible repair actions, you can use the metadata_analyze() procedure.

Log in to the database and run the following command as the administrator:

call nza..metadata_analyze('mode=backup');

The procedure then checks the consistency of the metadata of all analytics models. If necessary, the procedure also repairs possible inconsistencies. However, it checks and repairs only inconsistencies that must be fixed to ensure a correct restore operation of the metadata.

Restore

When a database is enabled for Netezza Analytics, additional groups and permissions are created. If you restore a database to another name or on another Netezza system, you must re-enable the database for Netezza Analytics after the restore operation:

To re-enable a database, do the following steps:

1. Go to the **/nz/export/ae/utilities/bin** directory.
2. Run the following command:
   ./create_inza_db.sh <database name>
3. Reassign the user rights as described in Assigning User Rights.

After a database that contains analytic models is restored, the Netezza Analytics metadata tables might contain wrong references, such as names or object IDs, and the definition of the metadata views might be wrong. Wrong references occur especially when you restore the database to another name or on another Netezza system. To fix the wrong metadata, run the **metadata_analyze** procedure as the administrator.

After you restore and re-enable the database, log in to the database and run the following command:
call nza..metadata_analyze('mode=restore');

The procedure then checks the consistency of the metadata of all analytics models. If necessary, the procedure also repairs possible inconsistencies and re-creates metadata views.

Notes:

- When the multiple schema mode is turned on, you can restore a database that was backed up when the multiple schema mode was turned off.
  To restore such a database, you must call the create_inza_db.sh <database> script as described in steps 1 to 3 above. You must do these steps even if you restore the database to the same name. For more information about database migration, see Migrating a Database for Multiple Schema Support.
- When the multiple schema mode is turned off, you cannot restore a database that was backed up when the multiple schema mode was turned on. In this case, the Netezza restore process merges the objects from all schemas into one schema. The merge, however, conflicts with the migration procedure for the database.
- When you restore a database that was backed up with Netezza Analytics V2.5.x in V3, use the same Netezza system for the restore procedure. Always run the **create_inza_db.sh <database>** script to migrate the metadata from 2.5.x format to 3.0 format. To fix possible inconsistencies, use the **metadata_analyze** procedure.

- You cannot restore a database on an NPS system with a system case that is different from the system case that was used during the backup. System cases can be uppercase or lowercase.

CHAPTER 3
Database and User Configuration

Configuration Tools

The following scripts ensure that databases are properly created and that access rights for various classes of user are properly set. The scripts are in the */nz/export/ae/utilities/bin* directory.

The following list shows the script and the categories, which these scripts belong to.

- Database creation and update
  - create_inza_db.sh
  - update_inza.dbs.sh
- Creation of user rights
  - create_inza_db_admin.sh
  - create_inza_db_developer.sh
  - create_inza_db_user.sh
- Database revocation
  - revoke_inza_db.sh
- Revocation of user rights
  - revoke_inza_db_admin.sh
  - revoke_inza_db_developer.sh
  - revoke_inza_db_user.sh

If you run the scripts without arguments, each script returns information about its expected syntax.

Note: Based on your environment and the policies of your organization, you might have to change or replace these scripts.

Creating a New Database

The **create_inza_db.sh** script is used to create a new Netezza Analytics-enabled database or to enable an existing database to be used with Netezza Analytics.

To run this script, navigate to /nz/export/ae/utilities/bin and use the following command. The script takes a database name as its only argument.

```
$./create_inza_db.sh <database_name>
```

The script creates or enables the specified database and then creates three groups for users of the database (where <*db*> is a placeholder for the actual database name):

- **<*db*>_inzaadmins**—For users who need to have local admin rights for this database. This group grants permissions to the user as if they were the database owner.
- **<*db*>_inzadevelopers**—For users who need to register new AEs, UDXs, or stored procedures.
- **<*db*>_inzausers**—For users who do not need to register AEs, UDXs, or stored procedures.

While running, the script provides progress notifications.

Running create_inza_db.sh on subordinate nodes within a replication system

To run **create_inza_db.sh** on a subordinate node, do the following steps:

1. Run the following command on the subordinate node:

   ```
   /nz/export/ae/utilities/bin/create_inza_db.sh <dbname>
   ```

   You get a list of SQL statements that you must run manually.
2. Run the listed SQL statements manually on the master node.
3. To complete the enablement, run the following command again on the subordinate node:

   ```
   /nz/export/ae/utilities/bin/create_inza_db.sh <dbname>
   ```

Assigning User Rights

By using the scripts that are described in the following sections, you can handle permissions for the user databases of Netezza Analytics. You can also administer the access rights for the users.

Notes:

1. It is not required to run any of these scripts for the database administrator, that is, the user ADMIN.
2. Netezza Analytics does not grant privileges to the PUBLIC group, nor does Netezza Analytics require that users are members of the PUBLIC group.

However, if you remove users from the PUBLIC group, consider that the removal might affect other Netezza commands or other software products.

3. To ensure that functions are not limited or lost, and that Netezza Analytics runs optimally, running
cross joins in the appropriate database or databases is mandatory. To run cross joins, admin rights, developer rights, or standard rights are required.

Assigning Admin Rights

The **create_inza_db_admin.sh** script is used to assign admin rights to an existing user for the specified database. Running this script for a given user adds that user to the <*db*>_inzaadmins group.

```
$./create_inza_db_admin.sh <database_name> <admin_user>
```

This script must be run once per user per database. Note that the specified user and database must already exist.

Assigning Developer Rights

The **create_inza_db_developer.sh** script is used to assign developer rights to an existing user for the specified database. Running this script for a given user adds that user to the <*db*>_inzadevelopers group.

```
$./create_inza_db_developer.sh <database_name> <developer_user>
```

This script must be run once per user per database. Note that the specified user and database must already exist.

Assigning Standard User Rights

The **create_inza_db_user.sh** script is used to assign standard user rights to an existing user for the specified database. Running this script for a given user adds that user to the <*db*>_inzausers group.

```
$./create_inza_db_user.sh <database_name> <database_user>
```

This script must be run once per user per database. Note that the specified user and database must already exist.

Running create_inza_db_<group>.sh on subordinate nodes within a replication system

To run one of the described scripts on a subordinate node, do the following steps:

1. Run the following command on the subordinate node:

   ```
   /nz/export/ae/utilities/bin/create_inza_db_user.sh <dbname> <username>
   ```

   You get a list of SQL statements that you must run manually.

2. Run the listed SQL statements manually on the master node.

Displaying Access Rights

Use the nzsql command \dpg <*groupname*> to display the Netezza Analytics-enabled group access rights.

Use \dp <*username*> to display Netezza Analytics-enabled user access right settings.

Disabling a Database

The **revoke_inza_db.sh** script is used to disable Netezza Analytics for the specified database. Running the script does not remove the specified database but instead revokes the permissions assigned to the groups in the database so that Netezza Analytics cannot be used in that database.

To run this script, navigate to /nz/export/ae/utilities/bin and use the following command. The script takes a database name as its only argument.

```
$./revoke_inza_db.sh <database_name>
```

Revoking User Rights

Three scripts are provided and are run based on the type of user access rights given to a user.

Revoking Admin Rights

The **revoke_inza_db_admin.sh** script is used to remove admin rights from an existing user for the specified database. Running this script for a given user removes that user from the <*db*>_inzaadmins group.

```
$./revoke_inza_db_admin.sh <database_name> <admin_user>
```

This script must be run once per user per database. Note that the specified user and database must exist.

Revoking Developer Rights

The **revoke_inza_db_developer.sh** script is used to remove developer rights from an existing user for the specified database. Running this script for a given user removes that user from the <*db*>_inzadevelopers group.

```
$./revoke_inza_db_developer.sh <database_name> <developer_user>
```

This script must be run once per user per database. Note that the specified user and database must exist.

Revoking Standard User Rights

The **revoke_inza_db_user.sh** script is used to remove standard user rights from an existing user for the specified database. Running this script for a given user removes that user from the <*db*>_inzausers group.

```
$./revoke_inza_db_user.sh <database_name> <database_user>
```

This script must be run once per user per database. Note that the specified user and database must exist.

Updating User Databases

To update and re-enable a user database that is enabled for Netezza Analytics, use the **create_inza_db.sh** script. To update and re-enable all user databases that are enabled for Netezza Analytics, use the **update_inza_dbs.sh** script.

A user database update might be required, for example, for the following reasons:

- If you upgrade your Netezza Analytics version to Version 3.0
- If you upgrade an NPS version to 7.0.3
  This upgrade changes the definition of system views.
- If you turn on the NPS full schema support by setting the <enable_schema_dbo_check> postgres variable to 1 or 2
- If you turn off the NPS full schema support by setting the <enable_schema_dbo_check> postgres variable to 0

To run the **update_inza_dbs.sh** script, do the following steps:

1. Go to the **/nz/export/ae/utilities/bin** directory.
2. Enter the following command:
   ./update_inza_dbs.sh

Migrating a Database for Multiple Schema Support

NPS 7.0.3 introduces multiple schema support for the Netezza databases. By default, multiple schema support is turned off. To activate it, use the enable_schema_dbo_check postgres variable.

Netezza Analytics supports all values of this variable.

- 0: Multiple schema support is disabled. This mode is the default mode.
- 1: Multiple schema support is enabled in limited mode.
- 2: Multiple schema support is enabled in full mode.

For more information about this variable, for example, how to specify it, see the *IBM Netezza System Administrator's Guide*.

You can switch between these modes, that is, you change the value of the enable_schema_dbo_check variable, you must restart the NPS system. However, if you have databases that are enabled for Netezza Analytics, you must do additional steps.

The following scenarios show the additional steps when you switch between the modes.

- Scenario 1: You work in mode 0, and you want to switch to mode 1 or 2.
  1. Set the enable_schema_dbo_check variable to 1 or 2.
  2. Restart NPS by using the **nzstop** command and the **nzstart** command.
  3. Call the **/nz/export/ae/utilities/bin/update_inza_dbs.sh** script.
- Scenario 2: You work in mode 1 or 2, and you want to switch to mode 0.
  1. Ensure that the INZA schema is not set as the default schema for all databases that are enabled for Netezza Analytics.
  2. Ensure that the default schemas of your databases are set as required. After you switch to mode 0, other schemas are not available.
  3. Set the enable_schema_dbo_check variable to 0.
  4. Call the **/nz/export/ae/utilities/bin/update_inza_dbs.sh -n** script.
     For reverse migration, use the option -n, that is 'noschema'.
  5. Restart NPS by using the **nzstop** command and the **nzstart** command.
- Scenario 3: You work in mode 1, and you want to switch to mode 2 or vice versa. In this case, additional migration steps are not required.
  1. Set the enable_schema_dbo_check variable to 1 or 2.
  2. Restart NPS by using the **nzstop** command and the **nzstart** command.

When you work in mode 0, a database has only one schema. Netezza Analytics then creates its database objects, such as analytic models or matrices, on this schema. When you work in mode 1 or 2, a database can have multiple schemas. Netezza Analytics then creates its database objects on a schema called INZA. The main purpose of the update script is to move the objects between these schemas for all databases that are enabled for Netezza Analytics.

In mode 0, the created database objects are always in the current schema. In mode 1 or 2, the database objects are not in the current schema because typically, the INZA schema is not the current schema.

You can, however, access tables and views in the INZA schema without specifying the schema name explicitly.

The statement SELECT * FROM V_NZA_MODELS, for example, works in all modes, regardless of the current schema. It is not required to write INZA.V_NZA_MODELS.

CHAPTER 4
Data Set Configuration

Using Sample Data Sets

Standard data-mining data sets are used in the Netezza Analytics document set to provide examples of how various functions and stored procedures perform in normal operation, as well as insight into how the various components of the product might be used in real-world scenarios.

Some of the sample data sets found in the documentation are not included with Netezza Analytics and must be acquired and installed to the NPS by an administrator before they can be used. The data cannot be used directly from the downloaded data set files, so a script has been provided to create the tables needed to house the data, manipulate the downloaded data, and load the data for use on the NPS appliance. Although not required, to use the documentation examples, the following data sets must be acquired:

- Retail
- CensusIncome
- WineQuality
- Adult
- Soybean
- Iris

The Acquiring Data Sets and Installing Data Sets sections describe the steps to acquire and configure the data for use on the Netezza appliance.

Acquiring Data Sets

The sample data sets used in the Netezza Analytics document set are freely available via the Internet. It is recommended that a subdirectory called **testData** be created in /nz/export/ae/utilities/bin for storing the downloaded files.

Table 1 describes the locations where sample data can be downloaded.

Table 1: Sample data set location information

Data Set Name	URL and File(s) to Download
Retail	URL: fimi.ua.ac.be/data/ File: retail.dat.gz (Click on the .gz link)
CensusIncome	URL: archive.ics.uci.edu/ml/databases/census-income/ File: census.tar.gz
WineQuality	URL: archive.ics.uci.edu/ml/machine-learning-databases/wine-quality/ File: winequality-white.csv
Adult	URL: archive.ics.uci.edu/ml/machine-learning-databases/adult File: adult.data
Soybean	URL: archive.ics.uci.edu/ml/machine-learning-databases/soybean Files: soybean-large.data and soybean-large.test
Iris	URL: archive.ics.uci.edu/ml/machine-learning-databases/iris/ File: iris.data

1. Download the data sets to a local machine from the locations provided in Table 1.

   Unpacked files, that is those without a .gz extension, can be downloaded by right-clicking on the file name on the appropriate contents page and selecting the option to save the file to disk.

   Important: *Do not unpack* the data files if they are packed.
2. Log in to the NPS as user **nz**.
3. Navigate to /nz/export/ae/utilities/bin.

   ```
   > cd /nz/export/ae/utilities/bin
   ```
4. Create a subdirectory called testData.

   ```
   > mkdir testData
   ```
5. Transfer the data files as they are originally named to the newly created testData directory.

Installing Data Sets

Once the applicable sample data files are acquired, the loadTestTable.sh script is used to create tables in the database and load the data from the downloaded data sets to the newly-created tables. The script resides in /nz/export/ae/utilities/bin.

If the script is re-run, all sample data and the related tables are removed from the database, and are completely reinstalled.

1. Ensure that the applicable data sets have been downloaded and reside on the NPS host. The recommended location is /nz/export/ae/utilities/bin/testData.

   Important: *Do not unpack* the data files if they packed.

2. As user **nz**, log onto the NPS host and navigate to /nz/export/ae/utilities/bin.

3. Run the **loadTestTables.sh** script.

   ```
   ./loadTestTables.sh
   ```

   Note: If the data files are not in the **testData** directory, the path must be provided as an argument, for example .

   ```
   ./loadTestTables.sh /nz/export/ae/utilities/bin/some_other_directory
   ```

The script provides notification output during its operation. As the script runs, it provides a message about the status of each data set being loaded. For example:

```
Creating base test tables in the nza database ...
--> STATUS: create was successful (rc=0)

Unpacking and preparing Retail data for loading from retail.dat.gz ...
Loading retail table ...
Load session of table 'RETAIL' completed successfully
```

If a data set was not downloaded, the script skips the installation procedure for that particular data set and continues with the remaining data sets.

Note: The script performs a series of tasks, including creating and loading data to a number of large tables and may take some time to run. This is normal.

Once complete, any temporary files created by the script during the process are removed. The downloaded data files and log files, however, remain on the NPS and must be deleted manually, if desired.

CHAPTER 5
Netezza Cartridge Manager Reference

Overview

Package management for Netezza Analytics is performed using the Netezza Cartridge Manager (nzcm). The nzcm tool is a package for the Netezza appliance that streamlines cartridge management by providing a set of functions to install, uninstall, register, unregister, and administer specific cartridges (packages) on the NPS.

The following sections describe the functionality and options of nzcm and provide instruction on using the tool to manage packages on the Netezza appliance.

Note: The steps in this section are provided for users who want to use the Netezza Cartridge Manager to have more control over the installation procedures. These steps are *not* required if Netezza Analytics has been installed using the provided installation script.

Netezza Cartridge Manager Setup

Extracting the Packages and nzcm Files

Netezza Analytics is distributed as a collection of packages in the form of .nzc files. You must extract these files from the full Netezza Analytics installation file packages. You can extract and access the packages and the Netezza Cartridge Manager (nzcm) through the Netezza Analytics installation utility.

On the appliance host, perform the following steps:

1. Ensure that the active user is **nz**.
2. Navigate to the directory where the **nz-analytics-v<*version*>.zip** is.
3. Run the command:

   ```
   unzip nz-analytics-v<version>.zip.
   ```

Note: The **unzip** utility must be used to unzip the file; **gunzip** cannot be used.

This command creates an **nzcmrepo** subdirectory under the directory where the files were extracted.

Installing nzcm

To install nzcm, perform the following steps:

1. Ensure that the active user is **nz**.
2. Navigate to the **nzcmrepo** subdirectory, typically /nz/var/inza/nzcmrepo.
3. Locate the nzcm file to determine the release number. The file is named in the form nzcm-<*version*>.
4. Uncompress the file. Run:

   ```
   tar -xf nzcm-<version>
   ```

5. Once uncompressed, navigate to the nzcm directory:

   ```
   cd /nz/var/inza/nzcmrepo/nzcm-<<version>
   ```

6. Install nzcm using the installation script:

   ```
   ./install.sh
   ```

   If a configuration exists from a previous installation, the following prompt may appear:

   ```
   Do you want to reset repository configuration? [y/n]
   ```

   Yes (**y**) is the default response. Answer no (**n**) *only* if the configuration has been changed and the modifications must be kept.

   The script installs nzcm to the /nz/var/nzcm directory and the repository is configured automatically.

7. As instructed by the output of the install.sh script, run:

   ```
   source ~/.bashrc .
   ```

8. Copy the packages and group files by executing the following commands:

   ```
   cd /nz/var/inza/nzcmrepo
   cp -f *.nzc /nz/var/nzcm/nzcmrepo/
   cp -f *.grp /nz/var/nzcm/nzcmrepo/
   ```

   Note that the destination directories must be empty before the copy command is issued.

Once complete, the packages are unzipped and moved to the appropriate directory; nzcm is installed.

Usage

The basic syntax for using nzcm is

```
nzcm <option> <cartridge_name>
```

For example, to install the latest version of the Netezza Spatial Package using nzcm, the syntax is:

```
nzcm -i inza_spatial
```

For a complete list of nzcm options, refer to the Netezza Cartridge Manager Option Reference section.

Netezza Cartridge Manager Function Reference

This section describes the Netezza Cartridge Manager functions and common error messages.

Install Process

To install a package, use the **-i** or **--install** commands, followed by the package or group name. The name may not always contain the product version number. If the version number is not included in the package name, nzcm installs the latest version available in the repositories.

To install a package run:

```
nzcm -i <package_name>
```

For example:

```
nzcm -i cpp_ae
nzcm -i cpp_ae-2.0.0.1
nzcm --install cpp_ae
nzcm --install cpp_ae-2.0.0.1
```

During the installation process, nzcm checks package dependencies and determines if an install can safely be performed. If one or more dependencies are not met, nzcm lists them, providing the opportunity to install the missing elements manually:

To verify if a package has been installed correctly, run:

```
nzcm --qv <package_name>
```

This command lists all currently installed versions of the package.

Registration Process

To register a package, use the **-r** or **--register** commands, followed by the package or group name. The name may not always contain the product version number. If the version number is not included in the package name, nzcm registers the latest installed version. To register a package run:

```
nzcm -r <package_name>
```

For example:

```
nzcm -r admin_utilities
```

This command registers the specified package in database “inza”.

To verify that a package was registered correctly run:

```
nzcm -V <package_name>
```

This command shows the databases where the specified package has been registered.

Note: To register spatial packages into specific databases, use one of the following commands depending on your spatial package:

```
nzcm -d <database> -r nzspatial
nzcm -d <database> -r nzspatial_esri
```

Unregistration Process

To unregister a package, use the **-u** or **--unregister** commands, followed by the package or group name. The name may not always contain the product version number. If the version number is not included in the package name, nzcm unregisters the latest installed version. To unregister a package run:

```
nzcm -u <package_name> <database_name>
```

For example:

```
nzcm -u admin_utilities
```

This command unregisters the specified package from the specified database.

Note: To unregister spatial packages from specific databases, use one of the following commands depending on your spatial package:

```
nzcm -d <database> -u nzspatial
nzcm -d <database> -u nzspatial_esri
```

Uninstall Process

To uninstall a package, use the **-e** or **--uninstall** commands followed by the package or group name. The name may not always contain the product version number. If the version number is not included in the package name, nzcm uninstalls the latest installed version. To uninstall a package run:

```
nzcm -e <package_name>
```

For example:

```
nzcm -e cpp_ae-2.0.0.1
nzcm --uninstall cpp_ae-2.0.0.1
nzcm -e cpp_ae
nzcm --uninstall cpp_ae
```

During uninstall, nzcm checks the dependencies of other installed packages and determines if the specified package can be safely removed. If one or more installed packages depends on the specified package, nzcm lists them and allows uninstallation if necessary.

Netezza Cartridge Manager Option Reference

Installation and Registration Options

The Cartridge Manager (nzcm) provides options to install, uninstall, register, and unregister packages on the NPS.

Table 2: Installation and registration options

Command	Description
nzcm -i <*package_name*> nzcm --install <*package_name*>	Installs the specified package.
nzcm -e <*package_name*> nzcm --uninstall <*package_name*>	Uninstalls the specified package[2].
nzcm -r <*package_name*> nzcm --register <*package_name*>	Registers the specified package.
nzcm -u <*package_name*> nzcm --unregister <*package_name*>	Unregisters the specified package.
nzcm -V <*package_name*> nzcm --verify <*package_name*>	Runs a verification test on the specified to package, reporting if it is registered correctly.

Package Status Options

The Cartridge Manager (nzcm) provides options to check the packages installed on the Netezza system as well as those available in the file repositories.

Table 3: Package status options

Command	Description
nzcm --qa	Lists all packages installed on the Netezza system.
nzcm --installed	Lists all packages installed on the Netezza system, including the release number.
nzcm --ql	Lists all cartridge names available in the nzcm repositories.
nzcm --repository	Lists all packages available in the nzcm repositories,

2 The package must be unregistered before it can be uninstalled.

Command	Description
	including the release number.
nzcm --qv <*package_name*>	Lists all versions of <*package_name*> currently installed on the Netezza system. For example: nzcm --qv cpp_ae
nzcm --qlv <*package_name*>	Lists all versions of <*package_name*> available in the nzcm repositories. For example: nzcm --qlv cpp_ae
nzcm -s <*pattern*>	Lists all packages in the repository with a file name matching the specified pattern. For example: nzcm -s ae
nzcm --sf <*pattern*>	Lists all packages in the repository that contain one or more file names matching the specified pattern. For example: nzcm --sf ae
nzcm --sc <*pattern*>	Lists all packages in the repository that contain a database object name matching the specified pattern. For example: nzcm --sc ae
nzcm --groups	Lists all package groups in the nzcm repositories.
nzcm –groupContent <*group_name*>	Lists all packages in the specified group.
nzcm --registered	Lists all packages registered on the Netezza system.
nzcm –dependencies <*package_name*>	Lists all the dependencies for the specified package.
nzcm --dependsOn <*package_name*>	Lists all the packages with a dependency on the specified package.
nzcm --dbobjects <*package_name*>	Lists all the database objects for the specified package.
nzcm --showDb <*package_name*>	Lists the database that the specified cartridge registers to.

Database Options

Table 4: Database options

Command	Description
nzcm -d <*database*> nzcm --database <*database*>	Specifies the name of the database to connect.
nzcm -U <*database*> nzcm --user <*database*>	Specifies the name of the user to use for the specified database.
nzcm -p <*database*> nzcm --password <*database*>	Specifies the password to use for the specified database.[3]

Search Options

All search options work on packages from the repository and use regular expressions as a search pattern.

Table 5: Search options

Command	Description
nzcm -s <*pattern*>	Lists all packages in the repository with a file name matching the specified pattern. For example: nzcm -s ae.
nzcm --sf <*pattern*>	Lists all packages in the repository that contain one or more file names matching the specified pattern. For example: nzcm --sf ae.
nzcm --sc <*pattern*>	Lists all packages in the repository that contain a database object name matching the specified pattern. For example: nzcm --sc ae.

IBM Netezza Analytics-specific Options

The following options are used to get information about setting options for nzcm itself.

3 It is not recommended to put the password in at the command line. Use NZ_PASSWORD or nzpassword instead.

Table 6: IBM Netezza Analytics-specific options

Command	Description
nzcm --inza	Displays the version of inza that is installed.
nnzm --archive inza-<*version*> <*filename*>	Creates a tar archive named <*filename*> with all the installed cartridges for the specified version of inza.

Cartridge Manager-specific Options

The following options are used to get information about options for nzcm itself.

Table 7: Cartridge Manager-specific options

Command	Description
nzcm -v nzcm --version	Displays the currently installed version of nzcm.
nzcm -h nzcm --help	Display the nzcm help, which lists all options.
nzcm -f nzcm --force	Forces the operation.
nzcm --wait	Waits for the current instance to exit.
nzcm --verbose	Displays the entire output of a command.
nzcm --nocolors	Suppresses output coloring.

Repository Configuration

The nzcm utility installs to /nz/var/nzcm. The repository configuration file is stored in /nz/var/nzcm/data and is named **nzcm_repository.conf**. Every line in this file contains a single repository description composed of:

- repository type
- colon - ":"
- repository path

The single repository type, INT, is an internal repository described as a specific directory in the file system. After a fresh installation, the file **nzcm_repository.conf** contains a single line:

```
INT:/nz/var/nzcm/nzcmrepo
```

Synchronization Options

Use the following commands to synchronize the repository configuration with the NPS database system.

Table 8: Synchronization options for a repository configuration

Command	Description
nzcm --syncDb	Synchronize the repository configuration with the NPS databases that might have changed. Cartridges that are registered in dropped databases are removed from the repository configuration. nzspatial databases that are restored after being dropped are added to the repository configuration again.
nzcm --syncSub	In a replication environment, synchronize the repository configuration a subordinate node with the latest repository configuration of its master node. Only cartridges that are registered in replicated databases are kept synchronized. If the cartridges that are installed on the master node and on the subordinate node do not match, you get a warning. You must then install these cartridges manually.

Note: In a replication environment, you should do the following steps regularly:

1. On the master node and on the subordinate nodes, run `nzcm --syncDb`.
2. Only on the subordinate nodes, run `nzcm --syncSub`.

CHAPTER 6

Using nzcm for Advanced Package Management

Overview

Package management for Netezza Analytics is performed using the Netezza Cartridge Manager (nzcm).

The installation script described in the Product Installation section installs nzcm and uses it to perform installation procedures for the Netezza Analytics product. However, nzcm is also available for standalone use for advanced package management.

The standalone nzcm package includes a script that can be used to install and manage the suite of the related Netezza Analytics packages once nzcm is installed. For more granular control, the tool can be used to manually manage the individual packages.

The following sections describe nzcm and provide instruction on using the tool to manually manage Netezza Analytics packages on the Netezza appliance.

Note: The steps in this section are provided for users who want to use the Netezza Cartridge Manager to have more control over the installation procedures. These steps are *not* required if Netezza Analytics has been installed using the provided installation script.

Using the nzcm Cartridge Install Script

An installation script is provided which allows the option of installing all of the additional packages included with Netezza Analytics, or only a subset of the packages. You will have an option to perform either a custom or express installation. The custom option allows you to install selected components within the packages, while the express option installs the entire package.

To use the script to install the Netezza Analytics components, perform the following steps:

1. Ensure that the Netezza Cartridge Manager (nzcm) is installed using the steps provided in the Netezza Cartridge Manager Setup section.
2. Navigate to the location where the nzcm files were extracted.
3. From the command line, execute the installation script.

   ```
   ./inzaCartridgeInstaller.sh
   ```

   The script provides a list of components to be installed, then shows a number of status messages about the progress of the script. Note that the installation process might take some time.

   The following prompt appears:

   ```
   Would you like to perform an Express (e) or Custom (c) install (e/c):
   ```

   Note: If you do not select either **e** or **c,** an error message appears, allowing you to exit the installer script.

   a. For Custom install, press **c**; for Express install press **e**.

      If you select custom installation, the script prompts to verify installation of each component. The example below shows the four component prompts. In each case in the example, the user chose to install the component.

      ```
      Install MapReduce components? (y/n): y
      Install Matrix components?
         Note: Matrix components are also required for PCA, Kmeans, GLM
      and Linear Regression. (y/n): y
      Install IBM Netezza In-database Analytics components? (y/n): y
      Install Spatial components? (y/n): y
      Install ESRI Spatial (legacy spatial will be installed otherwise)?
      (y/n): y
      ```

      Once selections are made for each component, a prompt similar to the following example, but reflecting the actual selections, appears:

      ```
      Please review the components to install:
       1) MapReduce: YES
       2) Matrix: YES
       3) IBM Netezza In-database Analytics: YES
       4) Spatial: YES (ESRI)
      Do you wish install the above selections?
         Enter "y" to continue, "x" to exit
         or any other key to be prompted to modify your selection:
      ```

   b. Select **y** to install the packages as described, or select any other key, then follow the prompts to change the selections.
4. Run the following script to re-enable all databases that are enabled for IBM Netezza Analytics:

   ```
   /nz/export/ae/utilities/bin/update_inza_dbs.sh
   ```

Using nzcm to Manage Packages

The process for installing, registering, verifying, unregistering, and uninstalling packages using nzcm is consistent throughout packages. The commands described in this section work for any package on the Netezza appliance.

When using nzcm commands, the package name must be supplied to ensure that the proper package is being managed. These package names are used when running the commands described in this section. The package names used for each component of Netezza Analytics are:

- Core Netezza Analytics product—**inza_base**; this package must be installed before the remaining packages can be installed
- Netezza Engine for MapReduce—**inza_mapreduce**
- Netezza Matrix Engine—i**nza_mpi**
- IBM Netezza In-Database Analytics—i**nza_no_mpi**
- Netezza Spatial Package—**inza_spatial**
- Netezza Spatial ESRI Package—**inza_spatial_esri**

Before installing any of the packages ensure that:

- the nzcm tool is installed
- the repository exists
- the package is available in the repository

Installing and Registering Netezza Analytics Manually

Once the packages are in the appropriate location and nzcm is installed, the main Netezza Analytics packages can be installed and registered.

1. Ensure that the active user is **nz**.
2. Run the following command to install Netezza Analytics:

   ```
   nzcm -i inza
   ```

   The installation process may take some time to complete.
3. Run the following command to register Netezza Analytics:

   ```
   nzcm -r inza
   ```

   The registration process may take some time to complete.
4. Run the following script to re-enable all databases that are enabled for IBM Netezza Analytics:

   ```
   /nz/export/ae/utilities/bin/update_inza_dbs.sh
   ```

When registration is complete, a message is displayed that a log file of the installation has been created in the /nz/var/log directory. To view all the packages that are registered in the various databases enter:

```
nzcm --registered
```

The Netezza Cartridge Manager includes many options. For more information, see the Netezza Cartridge Manager Option Reference section.

Uninstalling Netezza Analytics Manually

Although typically not necessary, under certain circumstances it may be useful to manually remove the Netezza Analytics package from the Netezza appliance. Note that if you intend to use the installation script, it is not necessary to perform this step manually, as the script automatically uninstalls previous releases.

Important: Once Netezza Analytics is unregistered, any AEs that have been implemented cannot be used until they are re-registered in the new database.

To remove the package, perform the following steps:

1. Ensure that the active user is **nz**.
2. Run the following command to unregister Netezza Analytics:

   ```
   nzcm -u inza
   ```

   The unregister process may take a few minutes.

A package must be unregistered before it can be uninstalled. Attempting to uninstall the package without unregistering it results in a warning message and the uninstall process is aborted.

1. Run the following command to uninstall Netezza Analytics:

   ```
   nzcm -e inza
   ```

   The uninstall process may take a few minutes.

Netezza Analytics is now removed from the database. A clean install of the Netezza Analytics package can now be performed.

CHAPTER 7
Setup and Installation Quick Start

Netezza Package Installation

This section provides quick start information on installing packages on an IBM Netezza appliance. The Netezza Cartridge Manager and the repository of cartridges are used to simplify the installation process.

With nzcm you can install any cartridge available in your repository. A repository associated with nzcm is used to store all of the available cartridges and dependencies between them.

To verify that all of the requirements have been made, run:

```
nzcm --ql
```

This command lists all the packages available in the repositories defined on the machine.

To install a package run:

```
nzcm -i <package_name>
```

This command installs the specified package and all of its dependencies. In some cases the package may require input during the installation process.

For more information on the installation using the Netezza Cartridge Manager, refer to the Netezza Cartridge Manager Function Reference section.

Netezza Package Administration

This section describes the administration of the Netezza packages.

Verifying Installation

To verify if a package has been installed correctly, run:

```
nzcm --qv <package_name>
```

This command lists all currently installed versions of the package.

Registering a Package

To register a package run:

```
nzcm -r <package_name>
```

This command registers the specified package in database **inza**.

Verifying Registration

To verify that a package was registered correctly run:

```
nzcm -V <package_name>
```

This command shows the databases where the specified package has been registered.

Unregistering a Package

To unregister a package run:

```
nzcm -u <package_name> <database_name>
```

This command unregisters the specified package from the specified database.

Uninstalling a Package

To uninstall a package run:

```
nzcm -e <package_name>
```

This command removes the specified package from the system.

For more information on the management using the Netezza Cartridge Manager, refer to the Netezza Cartridge Manager Function Reference section.

APPENDIX A
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