

NuoDB

re-defined relational database technology

<http://bit.ly/nuodb-sql>

Pinal Dave

<http://blog.sqlauthority.com>

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Author's Foreword

Let us take a look at the amount of information you process at your own business. If you pay attention to the underlying database for all these applications, you will be amazed. These days, every successful business processes way more data than they used to. The number of transactions and the amount of data is growing at an exponential rate. Big data is no longer a concept; it is now a reality.

Let us take a look at the amount of information you process at your own business. If you pay attention to the underlying database for all these applications, you will be amazed. These days, every successful business processes way more data than they used to. The number of transactions and the amount of data is growing at an exponential rate. Big data is no longer a concept; it is now a reality.

You can download NuoDB from here: <http://bit.ly/nuodb-sql>



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Chapter 1

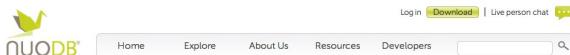
Getting Started with NuoDB

If you look around there are so many different big data solutions and it can be a quite difficult task to figure out where to begin. Personally, I have been experimenting with a lot of different solutions which allow my database to scale immediately without much hassle while maintaining optimal database performance. There are a multitude of solutions out there – but for most, even I have to learn their specific language and there is a lot of new exploration to do. Honestly, what I prefer is a product that will work with the language I know (SQL) and follows all the RDBMS concepts which I am familiar with (ACID etc.).

NuoDB is one such solution. It is an operational NewSQL database built on a patented emergent architecture with full support for SQL and ACID guarantees. In this chapter, I will explore how one can download and install NuoDB database.

Step 1:

Follow these examples to install NuoDB. Go to the NuoDB download page. Simply fill out the form, accept the online license agreement, and you will be taken directly to a page where you can select any platform you prefer to install NuoDB. In my example below, I selected the Windows 64-bit platform as it is one of the most popular NuoDB platforms. (You can also run NuoDB on Amazon Web Services but I prefer to install it on my local machine).



Download NuoDB

Step 1:

Select and download NuoDB Starlings Release 1.1 for your platforms on the right.

Step 2:

Join the [NuoDB Community Center](#) for tips on Getting Started, product documentation and to connect with other users.

Platform	Operating System	Download
	MacOS 10.7 or higher	.pkg
	Windows [64-bit] incl/32-bit clients	.exe
	RHEL 5.9 & 6.x (64-bit) SuSe Linux Enterprise Server 11 sp2 (64-bit) openSUSE 12.3 (64-bit) Amazon Basic EC2 (64-bit)	.rpm
	Ubuntu 11.10 & 12.x (64-bit)	.deb
	RHEL 5.9 & 6.x (64-bit) SuSe Linux Enterprise Server 11 sp2 (64-bit) openSUSE 12.3 (64-bit) Amazon Basic EC2 (64-bit) Ubuntu 11.10 & 12.x (64-bit)	.tar.gz
	Solaris 11 (x64) Joyent Smart OS	.tar.gz

Step 2:

Once you have downloaded the NuoDB installer, double click on it to install it on the Windows platform.

Name	Date modified	Type	Size
nuodb-1.1.windows.x64	6/07/13 4:37 PM	Application	154,319 KB

Here is the enlarged icon of the installer.

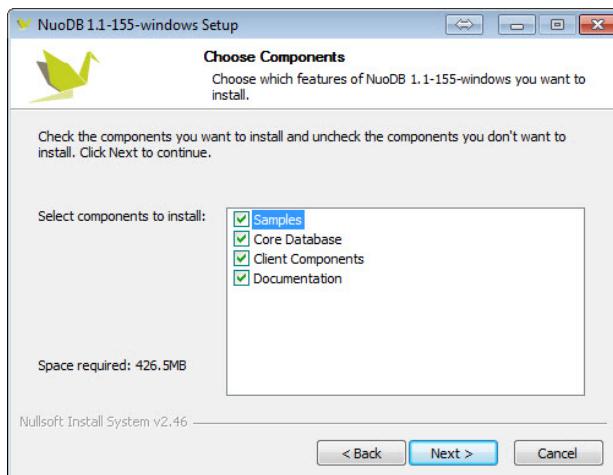


Step 3:

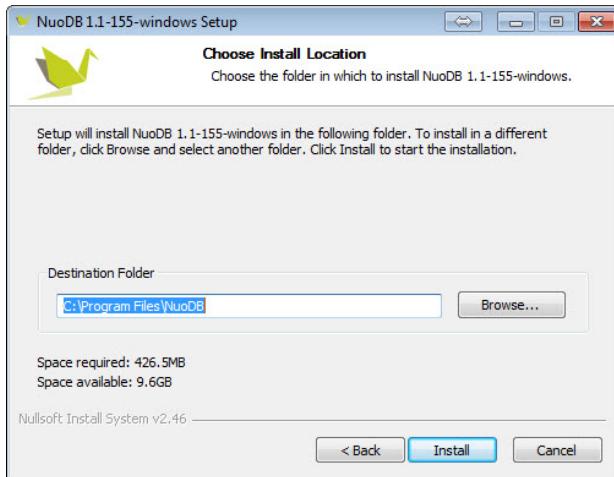
Follow the wizard installation, as it is pretty straight forward and easy to do.



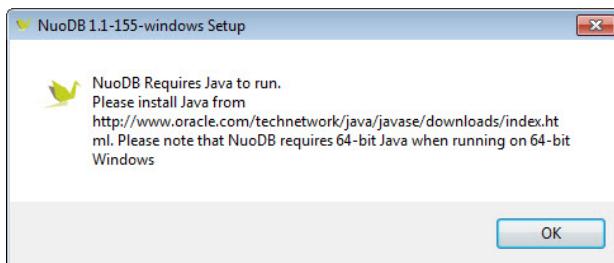
I have selected all the options to install as the overall installation is very simple and it does not take up much space.



I have installed it on my C drive but you can select your preferred drive.

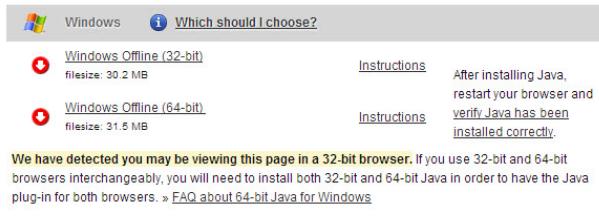


It is quite possible that if you do not have 64 bit Java, it will throw you the following error. If you face this error, I suggest you to download 64-bit Java from here.

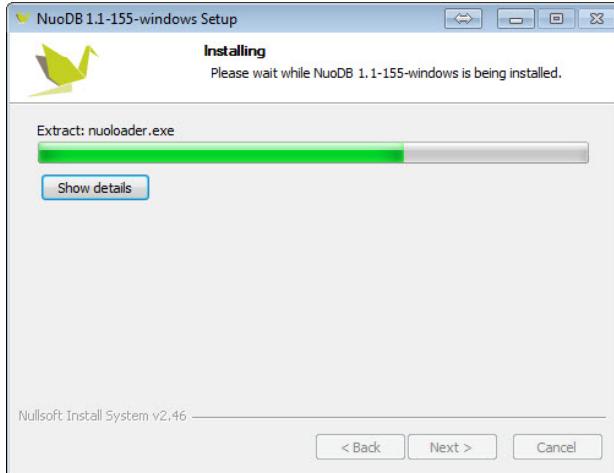


Make sure that you download 64-bit Java from the following link: <http://java.com/en/download/manual.jsp>

<http://java.com/en/download/manual.js>



If you already have Java 64-bit installed, you can continue with the installation as shown in the following image. Otherwise, install Java and start from with Step 1.



As in my case, I already have 64-bit Java installed – and you won't believe me when I say that the entire installation of NuoDB only took me around 90 seconds, but it is 100% true.



Click on Finish to end to exit the installation.

Step 4:

Once the installation is successful, NuoDB will automatically open the following two tabs – Console and DevCenter – in your preferred browser.



On the Console tab you can explore various components of the NuoDB solution, e.g. QuickStart, Admin, Explorer, Storefront and Samples. We will see various components and their usage in future chapters.

If you follow these steps, which I have shown to install NuoDB, you will agree that the installation is extremely smooth and it was indeed a pleasure to install a database product with such ease. If you have installed other database products in the past, you will absolutely agree with me.

So download NuoDB and install it today, and in the next chapter I will take the installation to the next level.



Chapter 2

Quick Start with Admin Sections of NuoDB

In the last chapter we have seen that it is extremely easy to install the NuoDB database on your local machine. Now that the application is properly set up, let us explore NuoDB a bit more and get familiar with the how it works and what the important areas of NuoDB are that you should learn.

As we have already installed NuoDB, now we will quickly start with two of the important areas : 1) Admin and 2) Explorer.

In this chapter I will explore how the Admin Section of the NuoDB Console works. In the next chapter we will learn how the Explorer Section works.

Let us go to the NuoDB Console by typing the following URL in your browser: <http://localhost:8080/>

It will bring you to the following screen:



On this screen you can see a big **Start QuickStart** button. Click on the button and it will bring you to following screen. On this screen you will find very important information about Domain and Database Settings. I have the habit – and maybe you do too – to not read what is written on the screen and keep on clicking on continue without reading. While we are familiar with most wizards, we can often miss the very important message on the screen.

Please note the information of Domain Settings and Database Settings from the following screen before clicking on Create Database.

The QuickStart starts or creates a NuoDB database with Hockey statistics. The database includes four tables: MASTER, HOCKEY, SCORING, and TEAM.

Domain Settings

- User: quickstart
- Password: quickstart

Database Settings

- User: dba
- Password: goalie
- Database: test
- Schema: HOCKEY

Create Database

Starting Storage Manager
Starting Transaction Engine
Creating Schema
Importing Sample Data

players	scoring	teams
<ul style="list-style-type: none"> playerID firstName lastName age weight footHNL lastNHL position goalie birthYear birthMon birthDay birthCountry birthState birthCity 	<ul style="list-style-type: none"> playerID year start end position gamesPlayed goals assists penaltyMinutes 	<ul style="list-style-type: none"> year teamID name conferenceID divisionID rank playoff games wins losses ties overtimeLosses

Domain Settings

User: quickstart

Password: quickstart

Database Settings

User: dba

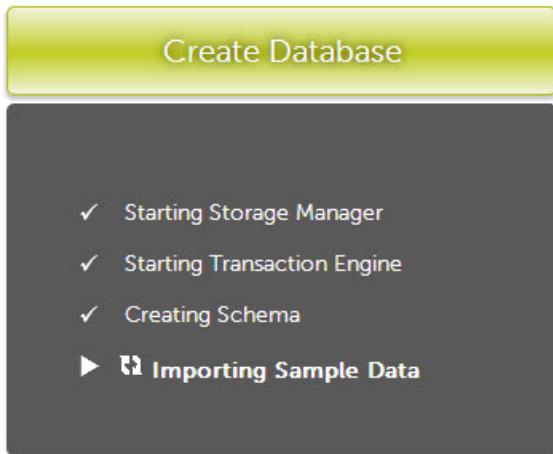
Password: goalie

Database: test

Schema: HOCKEY

Once you click on the **Create Database** button it will immediately start creating a sample database. First, it will start a

Storage Manager and right after that it will start a Transaction Engine. Once the engine is up, it will Create a Schema and Sample Data.



On the completion of creating the sample database it will show the following screen.



Create Database

- ✓ Starting Storage Manager
- ✓ Starting Transaction Engine
- ✓ Creating Schema
- ✓ Importing Sample Data

Congratulations! You can now access the newly created sample database using NuoDB Admin or Explorer.

Now is the time to explore NuoDB Admin or NuoDB Explorer. If you click on **Admin**, it will first show the following login screen. Enter `domain` for the username and `bird` for the password. Alternatively you can enter `quickstart` twice for username and password. It works as well.

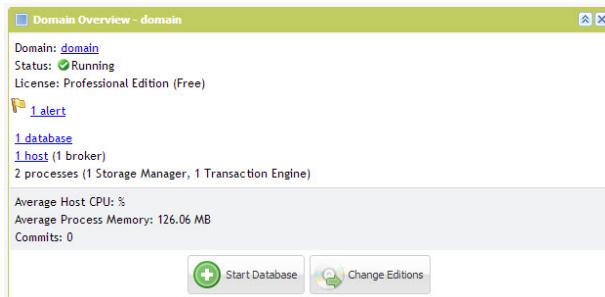


Once you enter into the Admin Section, on the left side you can see information about NuoDB and the Admin Console and on the right side you can see the domain overview area.

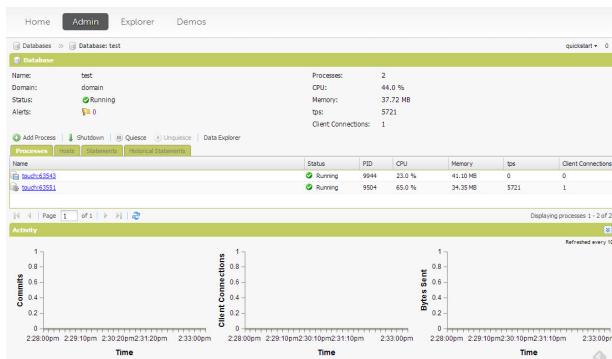
From this Administrative section you can do any of the following tasks:

- Create a view of the entire domain
- Add and remove databases
- Start and stop NuoDB Transaction Engines and Storage Managers
- Monitor transaction across all the NuoDB databases

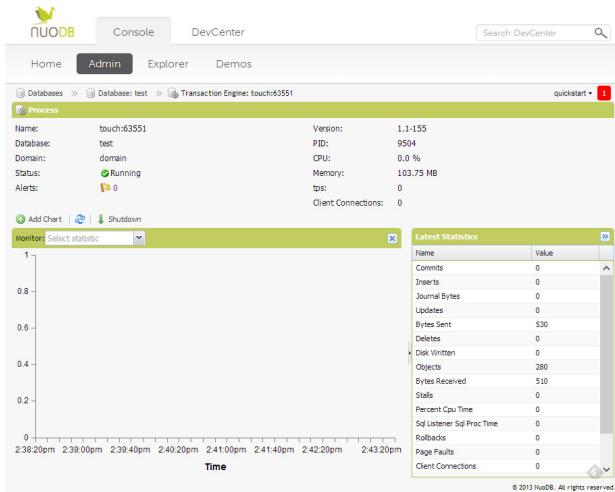
On the right side of the Admin Section we can see various information about a particular NuoDB domain. You can quickly view various alerts, find out information about the number of host machines that are provisioned for the domain, and see the number of databases and processes that are running in the domain.



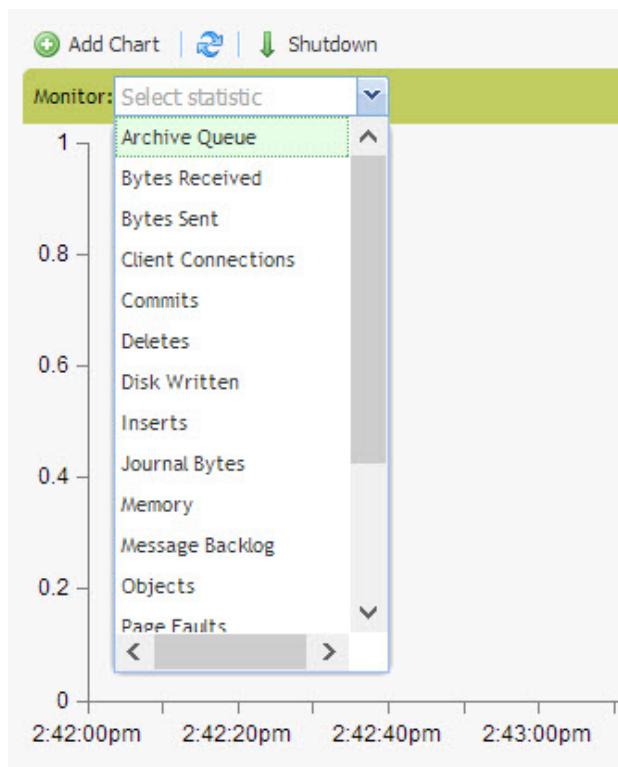
If you click on the **1 host** link you will be able to see various processes, CPU usage and other information. In the **Processes** section you can see that there are two different types of processes. The first process (where you can see the floppy drive icon) represents a running Storage Manager process and the second process a running Transaction Engine process.



You can click on the links for the Storage Manager and Transaction Engine to see further statistical details right down to the last byte of the data.



There are various charts available for analysis as well. I think the product is quite mature and the user can add different monitor charts to the Admin section.



Additionally, the Admin section is the place where you can create and manage new databases. I hope today's tutorial gives you enough confidence that you can try out NuoDB and checkout various administrative activities with the database. I am personally impressed with their dashboard related to various counters.

In the next chapter, we will try out the Explorer section of NuoDB, which allows us to run SQL queries and write SQL code. Meanwhile, I strongly suggest you download and install NuoDB and get yourself familiar with the product.



Chapter 3

Quick Start with Explorer Sections of NuoDB

NuoDB is very innovative and easy-to-use product. I can clearly see how one can scale-out NuoDB with so much ease and confidence. In the first chapter we discussed how we can install NuoDB, and in the second chapter we discussed how we can manage the NuoDB database transaction engines and storage managers with a few clicks.

In this chapter, we will learn how we can use the **Explorer feature** of NuoDB to do various SQL operations. NuoDB has a browser-based Explorer, which is very powerful and has many of the features any IDE would normally have. Let us see how it works in the following step-by-step tutorial.

Let us go to the NuoDBNuoDB Console by typing the following URL in your browser: <http://localhost:8080/>

It will bring you to the **QuickStart** screen. Make sure that you have created the sample database. If you have not created sample database, click on **Create Database** and create it successfully.



Create Database

- ✓ Starting Storage Manager
- ✓ Starting Transaction Engine
- ✓ Creating Schema
- ✓ Importing Sample Data

Congratulations! You can now access the newly created sample database using NuoDB Admin or Explorer.

Now go to the NuoDB Explorer by clicking on the main tab, and it will ask you for your domain username and password. Enter the username as *domain* and password as *bird*. Alternatively you can also enter username as *quickstart* and password as *quickstart*.

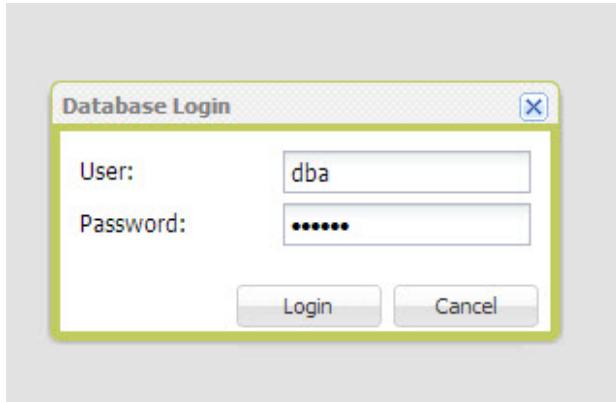


Once you enter the password you will be able to see the databases. In our example we have installed the Sample Database, hence you will see the Test database in our Database Hierarchy screen.

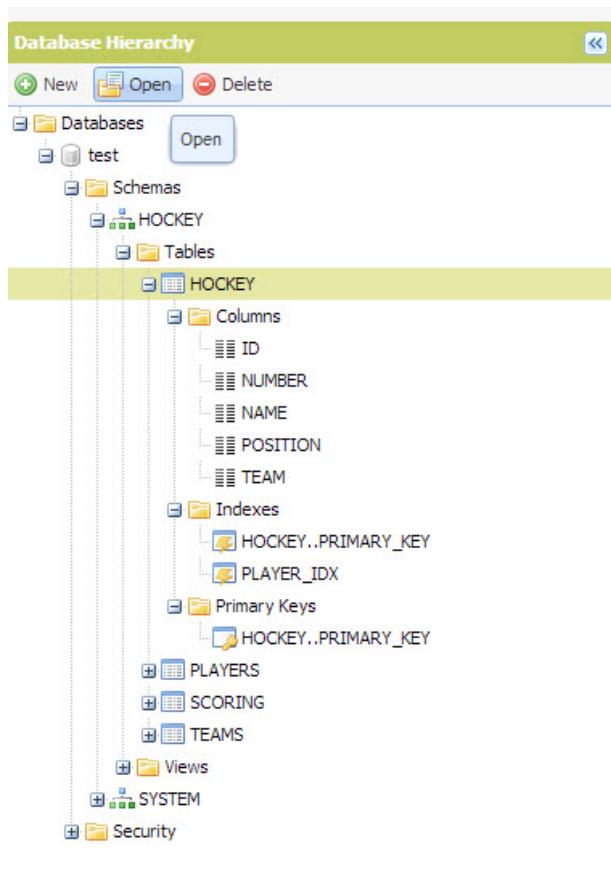
The image shows the NUODB Explorer interface. The top navigation bar includes the NUODB logo, "Console", "DevCenter", and tabs for "Home", "Admin", "Explorer" (which is selected and highlighted in dark grey), and "Demos". Below this is the "Database Hierarchy" section. The title bar for this section is "Database Hierarchy" with a back arrow icon. Underneath are three buttons: "New", "Open", and "Delete". A tree view shows a folder named "Databases" containing a single item named "test".

When you click on database it will ask for the database login. Note that Database Login is different from the Domain login and you

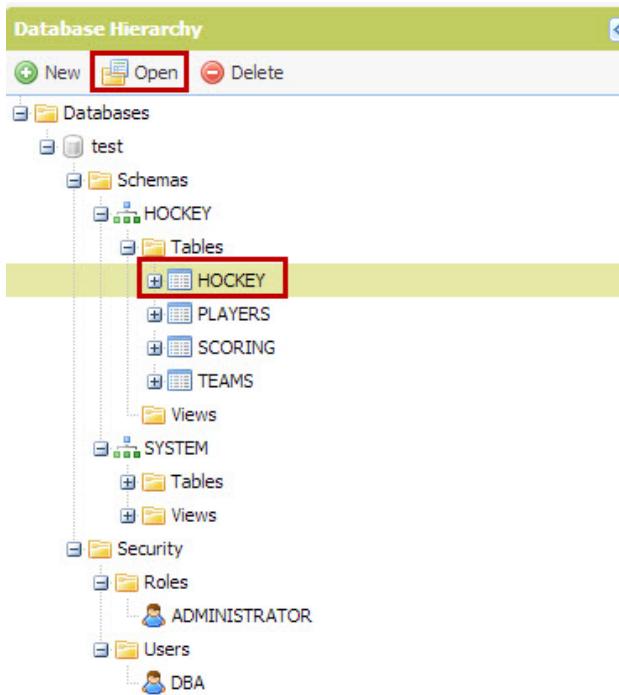
will have to enter your database login over here. In our case the database username is *dba* and password is *goalie*.



Once you enter a valid username and password it will display your database. Further expand your database and you will notice various objects in your database.



Once you explore various objects, select any database and click on **Open**.



When you click on **Execute**, it will display the SQL script to select the data from the table. The autogenerated script displays entire result set from the database.

The screenshot shows the NuoDB Explorer interface. At the top, there's a toolbar with 'Execute', 'Query Plan', 'List SQL Statements', 'List Tables', 'Help', 'Database: test', and 'Schema: HOCKEY'. Below the toolbar, a code editor window contains the following SQL query:

```
1 SELECT * FROM "HOCKEY"
```

Below the code editor is a 'Query Result' table with the following data:

ID	NUMBER	NAME	POSITION	TEAM
1	37	PATRICE BERGERON	Forward	Bruins
2	48	CHRIS BOURQUE	Forward	Bruins
3	11	GREGORY CAMERON	Forward	Bruins
4	18	NATHAN HORTON	Forward	Bruins
5	23	CHRIS KELLY	Forward	Bruins
6	46	DAVID KREJCI	Forward	Bruins
7	17	MILAN LUCIC	Forward	Bruins
8	64	LANE MACDERMID	Forward	Bruins
9	63	BRAD MARCHAND	Forward	Bruins
10	20	DANIEL PAILLE	Forward	Bruins
11	49	RICH PEVERLEY	Forward	Bruins

The NuoDB Explorer is very powerful and makes the life of developers very easy. If you click on **List SQL Statements** it will list all the available SQL statements right away in Query Editor. You can see the popup window in following image.

The screenshot shows the NuoDB Explorer interface with a 'Query 1' tab selected. At the top, there's a toolbar with 'Execute', 'Query Plan', 'List SQL Statements', 'List Tables', 'Help', 'Database: test', and 'Schema: HOCKEY'. Below the toolbar, the code editor window displays a list of SQL statements:

```
1 SELECT * FROM "HOCKEY"
DROP VIEW IF EXISTS
EXPLAIN
FROM
GRANT
GROUP BY
INSERT INTO
ORDER BY
RELEASE SAVEPOINT
REPLACE
REVOKE ROLE
```

Here is the cool thing for geeks. You can even click on Query Plan and it will display the text based query plan as well. In case of a SELECT, the query plan will be much simpler, however, when we write complex queries it will be very interesting. We can use the query plan tab for performance tuning of the database.

The screenshot shows the NuoDB Explorer interface with a query editor window titled "Query 1". The toolbar includes "Execute", "Query Plan", "List SQL Statements", "List Tables", "Help", "Database: test", and "Schema: HOCKEY". The main area contains the SQL statement:

```
1 | SELECT * FROM "HOCKEY"
```

A green bar labeled "Query Plan" is visible at the bottom of the editor. Below it, the results of the query are displayed as a "Select List" containing fields from the "HOCKEY" table.

```
Select
List
Field HOCKEY.HOCKEY.ID (1)
Field HOCKEY.HOCKEY.NUMBER (1)
Field HOCKEY.HOCKEY.NAME (1)
Field HOCKEY.HOCKEY.POSITION (1)
Field HOCKEY.HOCKEY.TEAM (1)
Exhaustive HOCKEY.HOCKEY (1)
```

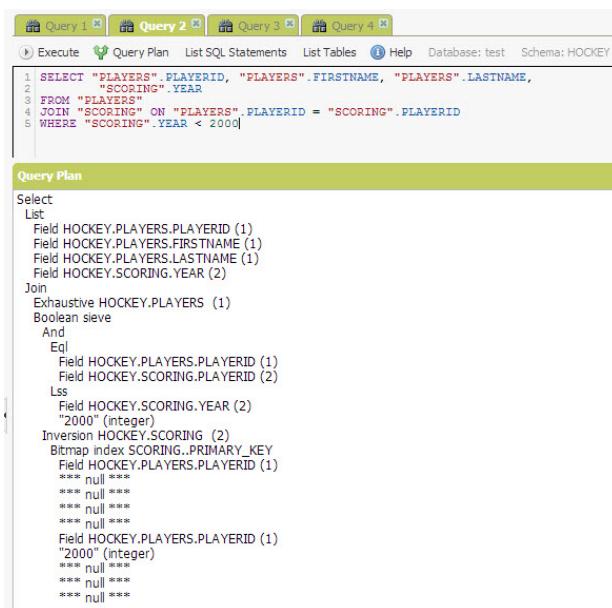
Here is another feature, when we click on **List Tables** in NuoDB Explorer. It lists all the available tables in the query editor. This is very helpful when we are writing a long complex query.

The screenshot shows the NuoDB Explorer interface with a query editor window titled "Query 1". The toolbar includes "Execute", "Query Plan", "List SQL Statements", "List Tables", "Help", "Database: test", and "Schema: HOCKEY". The main area contains the SQL statement:

```
1 | SELECT * FROM "HOCKEY"
```

The "List Tables" button in the toolbar is highlighted. A dropdown menu is open, listing the available tables: "HOCKEY", "PLAYERS", "SCORING", and "TEAMS".

Here is a relatively complex example I have built using Inner Join syntax. Right below I have displayed the Query Plan. The query plan displays all the little details related to the query.



The screenshot shows the NuoDB Admin interface with four tabs at the top: Query 1, Query 2, Query 3, and Query 4. The Query 2 tab is active. Below the tabs is a toolbar with icons for Execute, Query Plan, List SQL Statements, List Tables, Help, Database: test, and Schema: HOCKEY. The main area contains the following SQL query:

```

1 SELECT "PLAYERS".PLAYERID, "PLAYERS".FIRSTNAME, "PLAYERS".LASTNAME,
2      "SCORING".YEAR
3   FROM "PLAYERS"
4  JOIN "SCORING" ON "PLAYERS".PLAYERID = "SCORING".PLAYERID
5 WHERE "SCORING".YEAR < 2000

```

Below the query is a section titled "Query Plan" with a green header. The plan details the execution steps:

- Select List:** Field HOCKEY.PLAYERS.PLAYERID (1), Field HOCKEY.PLAYERS.FIRSTNAME (1), Field HOCKEY.PLAYERS.LASTNAME (1), Field HOCKEY.SCORING.YEAR (2)
- Join:**
 - Exhaustive HOCKEY.PLAYERS (1)
 - Boolean sieve
 - And
 - Eq!
 - Field HOCKEY.PLAYERS.PLAYERID (1)
 - Field HOCKEY.SCORING.PLAYERID (2)
 - Lss
 - Field HOCKEY.SCORING.YEAR (2)
 - "2000" (integer)
 - Inversion HOCKEY.SCORING (2)
 - Bitmap index SCORING..PRIMARY_KEY
 - Field HOCKEY.PLAYERS.PLAYERID (1)
 - *** null ***
 - *** null ***
 - *** null ***
 - *** null ***
 - Field HOCKEY.PLAYERS.PLAYERID (1)
 - "2000" (integer)
 - *** null ***
 - *** null ***
 - *** null ***

Well, we just wrote multi-table query and executed it against the NuoDB database. You can use the NuoDB Admin section and do various analyses of the query and its performance.

NuoDB is a distributed database built on a patented emergent architecture with full support for SQL and ACID guarantees. It allows you to add Transaction Engine processes to a running system to improve the performance of your system. You can also add a second Storage Engine to your running system for redundancy purposes. Conversely, you can shut down processes when you don't need the extra database resources.

NuoDB also provides developers and administrators with a single intuitive interface for centrally monitoring deployments.

If you have read all these chapters and have not tried out NuoDB, I strongly suggest that you download it today and catch up on the lessons with me. Trust me, even though the product is very powerful, it is extremely easy to learn and use.



Chapter 4

Migrate Database from SQL Server to NuoDB

Data is growing exponentially and every organization with growing data is thinking of the next big innovation in the world of Big Data. Big Data is indeed a future for every organization at a certain point in time. Just like every other “next big thing,” big data has its own challenges and issues. The biggest challenge associated with big data is to find the ideal platform which supports the scalability and growth of the data. If you are familiar with SQL Server, you must be familiar with NuoDB. I have been working with NuoDB for a while and their recent release is the best thus far.

NuoDB is an elastically scalable SQL database that can run on local host, datacenter and cloud-based resources. A key feature of the product is that it does not require sharding. In the first chapter, we were able to install NuoDB in less than 90 seconds and in chapters 2 and 3 we explored the Explorer and Admin sections.

I have shared my love of NuoDB with many friends and colleagues. One of the frequently asked questions I’ve received is if there is any way to migrate data from SQL Server to NuoDB. The fact is that there is indeed a way to do so and NuoDB provides a fantastic tool which can help users to do it. NuoDB Migrator is a command line utility that supports the migration of Microsoft SQL Server, MySQL, Oracle, and PostgreSQL schemas and data to NuoDB.

The migration to NuoDB is a three-step process:

- NuoDB Migrator generates a schema for a target NuoDB database
- It loads data into the target NuoDB database
- It dumps data from the source database

Let's see how we can migrate our data from SQL Server to NuoDB using a simple three-step approach. But before we do that we will create a sample database in MSSQL and later we will migrate the same database to NuoDB:

Setup Step 1: Build a sample data

```
CREATE DATABASE [Test];
CREATE TABLE [Department] (
    [DepartmentID] [smallint] NOT NULL,
    [Name] VARCHAR(100) NOT NULL,
    [GroupName] VARCHAR(100) NOT NULL,
    [ModifiedDate] [datetime] NOT NULL,
    CONSTRAINT [PK_Department_DepartmentID]
PRIMARY KEY CLUSTERED
    ( [DepartmentID] ASC )
) ON [PRIMARY];
INSERT INTO Department
SELECT *
FROM
AdventureWorks2012.HumanResources.Department;
```

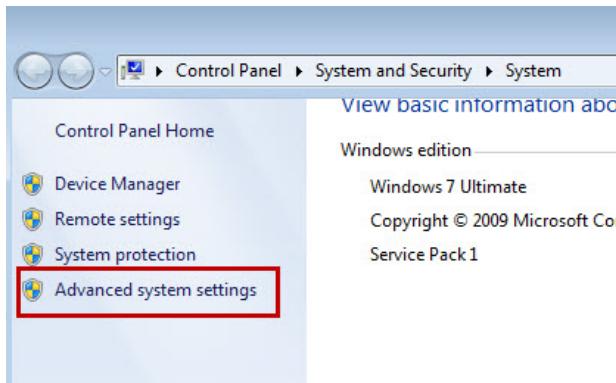
Note that I am using the SQL Server AdventureWorks database to build this sample table but you can build this sample table any way you prefer.

Setup Step 2: Install Java 64 bit

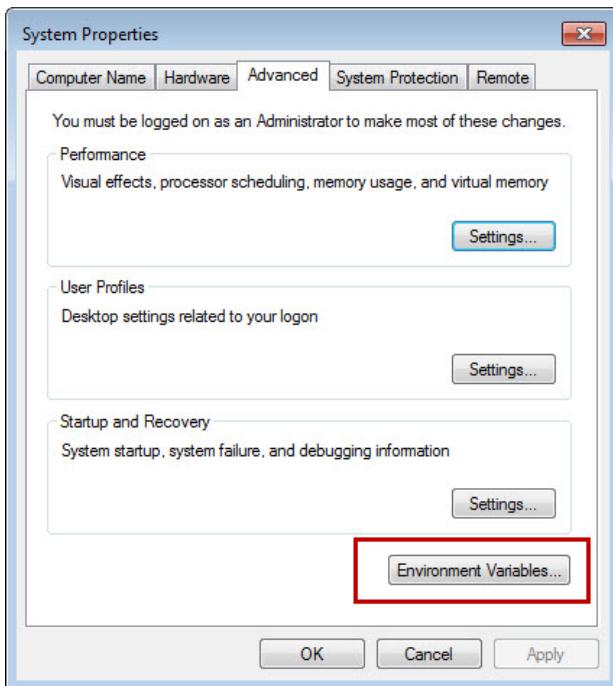
Before you can begin the migration process to NuoDB, make sure you have 64-bit Java installed on your computer. This is due to the fact that the NuoDB Migrator tool is built in Java. You can download 64-bit Java for Windows, Mac OSX, or Linux from the following link: <http://java.com/en/download/manual.jsp>.



One more thing to remember is to make sure that the path in your environment settings is set to your JAVA_HOME directory or else the tool will not work. Here is how you can do it:



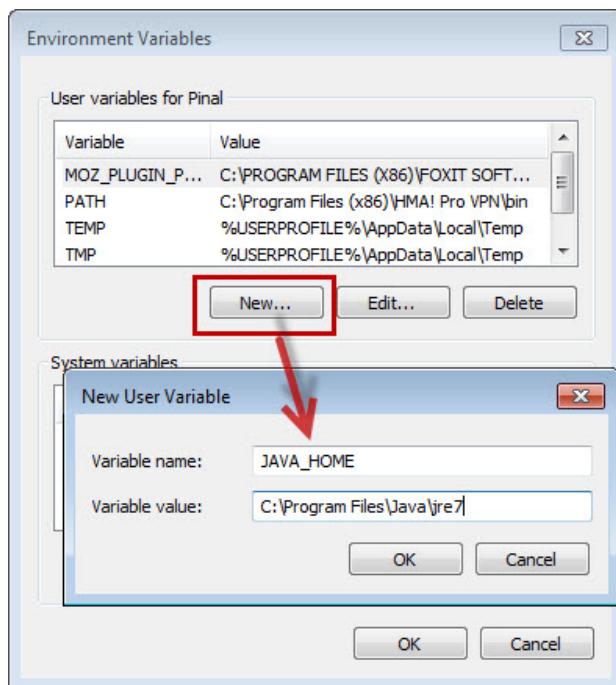
Go to My Computer >> Right Click >> Select Properties >> Click on Advanced System Settings >> Click on Environment Variables >> Click on New and enter the following values.



Variable

Name: JAVA_HOME

Variable Value: C:\Program Files\Java\jre7



Make sure you enter your Java installation directory in the Variable Value field.

Setup Step 3: Install JDBC driver for SQL Server.

There are two JDBC drivers available for SQL Server. Select the one you prefer to use by following one of the two links below:

- Microsoft JDBC Driver
- jTDS JDBC Driver

In this example we will be using jTDS JDBC driver. Once you download the driver, move the driver to your NuoDB installation folder. In my case, I have moved the JAR file of the driver into the C:\Program Files\NuoDB\tools\migrator\jar folder as this is my NuoDB installation directory.

Now we are all set to start the three-step migration process from SQL Server to NuoDB:

Migration Step 1: NuoDB Schema Generation

Here is the command I use to generate a schema of my SQL Server Database in NuoDB. First I go to the folder C:\Program Files\NuoDB\tools\migrator\bin and execute the nuodb-migrator.bat file.

Note that my database name is *test*. Additionally my username and password is also *test*. You can see that my SQL Server database is running on my localhost on port 1433. Additionally, the schema of the table is ‘dbo’.

```
nuodb-migrator           schema      -
source.driver=net.sourceforge.jtds.jdbc.Driver   -
source.url=jdbc:jtds:sqlserver://localhost:1433/   -
source.username=test -source.password=test -source.catalog=test -
source.schema=dbo -output.path=/tmp/schema.sql
```

The above script will generate a schema of all my SQL Server tables and will put it in the folder C:\tmp\schema.sql. You can open the schema.sql file and execute this file directly in your NuoDB instance.

Please note that if you have not yet created the schema in the NuoDB database, you should create it before executing this step.



Migration Step 2: Generate the Dump File of the Data

Once you have recreated your schema in NuoDB from SQL Server, the next step is very easy. Here we create a CSV format dump

file, which will contain all the data from all the tables from the SQL Server database.

The command to do so is very similar to the above command. Be aware that this step may take a bit of time based on your database size.

```
nuodb-migrator           dump      -
source.driver=net.sourceforge.jtds.jdbc.Driver      -
source.url=jdbc:jtds:sqlserver://localhost:1433/      -
source.username=test -source.password=test -source.catalog=test -
source.schema=dbo -output.type=csv -output.path=/tmp/dump.cat
```

Once the above command is successfully executed you can find your CSV file in the C:\tmp\ folder. However, you do not have to do anything manually. The third and final step will take care of completing the migration process.

Migration Step 3: Load the Data into NuoDB

After building schema and taking a dump of the data, the very next step is essential and crucial. It will take the CSV file and load it into the NuoDB database.

```
nuodb-migrator           load      -
target.url=jdbc:com.nuodb://localhost:48004/mytest      -
target.schema=dbo -target.username=test -target.password=test -
input.path=/tmp/dump.cat
```

Please note that in the above script we are now targeting the NuoDB database, which we have already created with the name of "MyTest". If the database does not exist, create it manually before executing the above script. I have kept the username and password as *test*, but please make sure that you create a more secure password for your database for security reasons.

Voila! You're Done

That's it. You are done. It took three setup steps and three migration steps to migrate your SQL Server database to NuoDB. You can now start exploring the database and build excellent, scale-out applications.

The screenshot shows a database interface with a query editor at the top containing the SQL command: `1 SELECT * FROM "Department"`. Below the query is a table titled "Query Result" with 16 rows of department data. The columns are: DepartmentID, Name, GroupName, and ModifiedDate. The data includes various departments like Engineering, Tool Design, Sales, Marketing, Purchasing, Research and Development, Production, etc., each associated with a specific group name and a modified date of 2002-06-01 05:... .

DepartmentID	Name	GroupName	ModifiedDate
1	Engineering	Research and D...	2002-06-01 05:...
2	Tool Design	Research and D...	2002-06-01 05:...
3	Sales	Sales and Marke...	2002-06-01 05:...
4	Marketing	Sales and Marke...	2002-06-01 05:...
5	Purchasing	Inventory Mana...	2002-06-01 05:...
6	Research and D...	Research and D...	2002-06-01 05:...
7	Production	Manufacturing	2002-06-01 05:...
8	Production Cont...	Manufacturing	2002-06-01 05:...
9	Human Resources	Executive Gene...	2002-06-01 05:...
10	Finance	Executive Gene...	2002-06-01 05:...
11	Information Ser...	Executive Gene...	2002-06-01 05:...
12	Document Control	Quality Assurance	2002-06-01 05:...
13	Quality Assurance	Quality Assurance	2002-06-01 05:...
14	Facilities and Ma...	Executive Gene...	2002-06-01 05:...
15	Shipping and Re...	Inventory Mana...	2002-06-01 05:...
16	Executive	Executive Gene...	2002-06-01 05:...

In this chapter, I have done my best to come up with a simple and easy process, which you can follow to migrate your app from SQL Server to NuoDB.

Download NuoDB

I strongly encourage you to download NuoDB and go through my 3-step migration tutorial from SQL Server to NuoDB.



Chapter 5

NuoDB and Third Party Explorer

I have introduced each of these chapters with some history of “big data,” and why our changing world needs a new way to store data. Here is one more analogy: Data is indeed a big world and the learning of Big Data is like spaghetti – no one really knows where to start, you just have to start in the middle. So I decided to learn it with the help of NuoDB. You can download NuoDB and continue your journey with me as well.

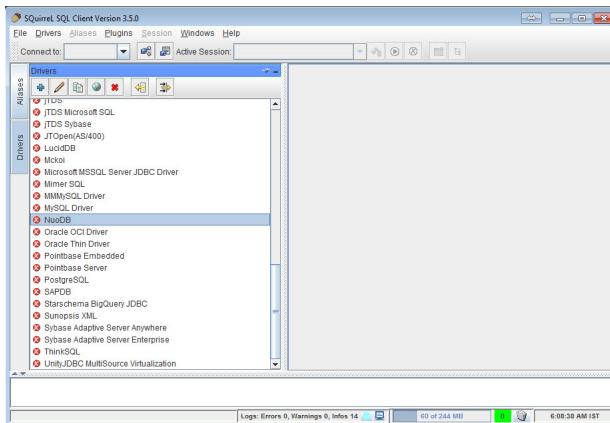
One question I hear a lot: “I like the NuoDB Explorer but can I connect to NuoDB from my preferred Graphical User Interface?” Honestly, I did not expect this question to be asked of me so many times, but it is clear that we developers absolutely want to learn new things and along with that we do want to continue to use our most efficient developer tools. Now here is the answer to the question:

“Absolutely, you can continue to use any of the following most popular SQL clients.” NuoDB supports the three most popular third-party SQL clients. In all the leading development environments there are always more than one database installed and managing each of them with a different tool is often a very difficult task. Developers like to use one tool, which can control most of the databases. Once developers are familiar with one database tool it is very difficult for them to switch to another tool. This is particularly difficult when we developers find that tool to be the key reason for our efficiency.

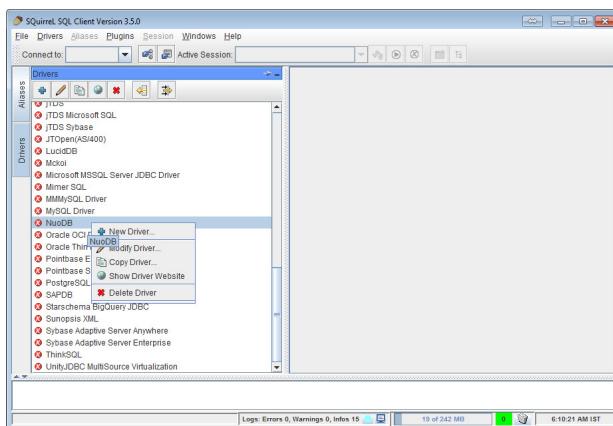
Let us see how to install each of the NuoDB supported third party tools along with a quick tutorial on how to go about using them.

SQuirreL SQL Client

First download SQuirreL Universal SQL client. On the Windows platform you can double-click on the file and it will install the SQuirrel client. Once it is installed, open the application and it will bring up the following screen. Now go to the Drivers tab on the left side and scroll it down. You will find NuoDB mentioned there.



Now right click over it and click on **Modify Driver**.



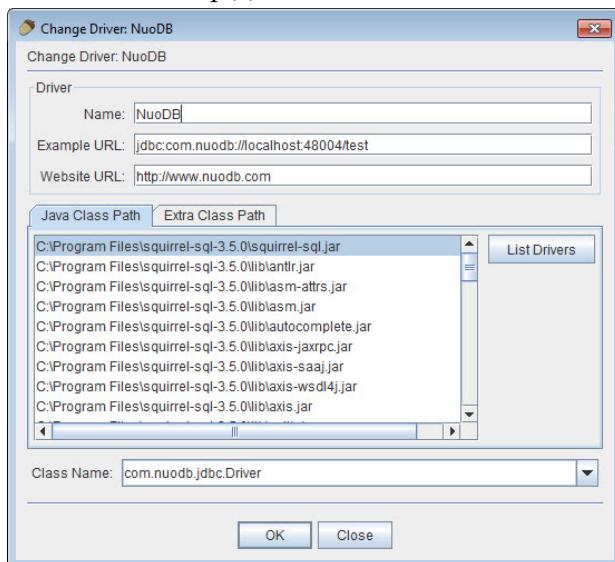
Now here is where you need to make sure that you make proper entries or your client will not work with the database. Enter

following values:

Name: NuoDB

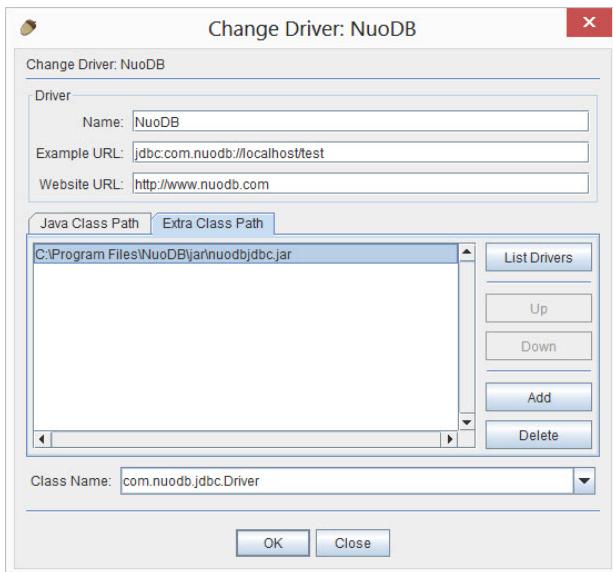
Example URL: jdbc:com:nuodb://localhost:48004/test

Website URL: http://www.nuodb.com

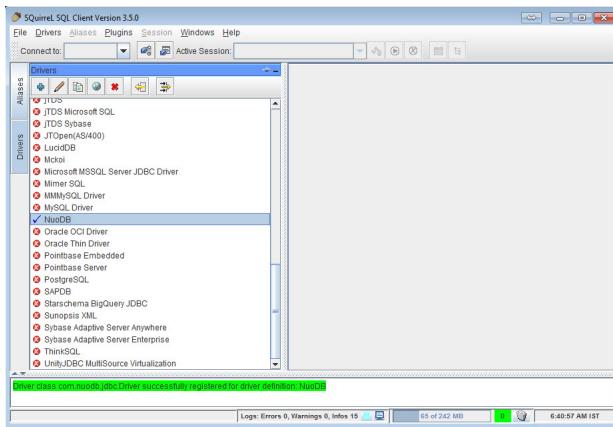


Now click on the **Extra Class Path** tab and add the location of the nuodbjdbc.jar file. If you are following along with the chapters and have installed NuoDB in the default location, you will find the default path as C:\Program Files\NuoDB\jar\nuodbjdbc.jar.

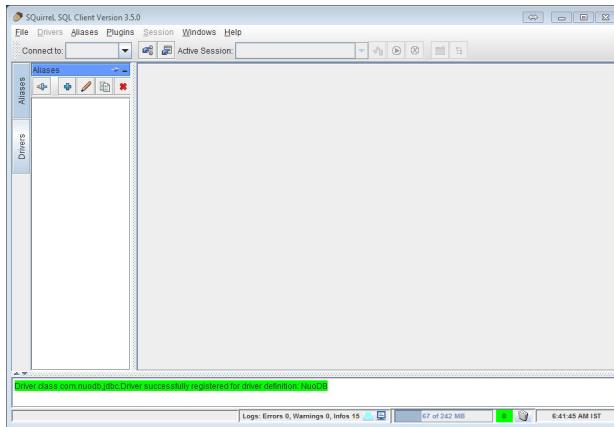
The class name of the driver is automatically populated.



Once you click **OK** you will see that there is a small icon displayed to the left of NuoDB, which shows that you have successfully configured and installed the NuoDB driver.



Now click on the tab of **Aliases** tab and you will notice that it is empty. Now click on the big **Plus** icon and it will open screen of adding an alias.



“Alias” means nothing more than adding a database to your system. The database name of the original installation can be anything and, if you wish, you can register the database with any other alternative name.

Here are the details you should fill into the Alias screen below.

Name: Test (or your preferred alias)

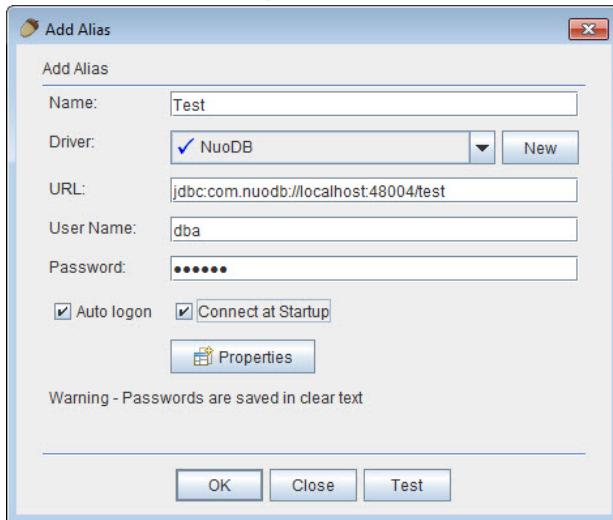
Driver: NuoDB

URL: jdbc:com:nuodb://localhost:48004/test (This is for *test* database)

User Name: dba (This is the username which I entered for *test* Database)

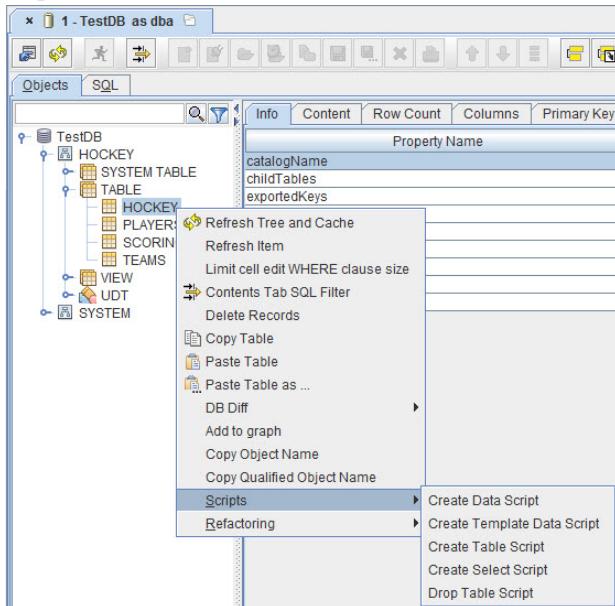
Password: goalie (This is the password which I entered for *test* Database)

Check Auto Logon and Connect at Startup and click on OK.



That's it! You are done. On the right side you will see a table name and on the left side you will see various tabs with all the relevant details from respective table. You can see various metadata, schemas, data types and other information in the table.

In addition, you can also generate script and do various important tasks related to database.



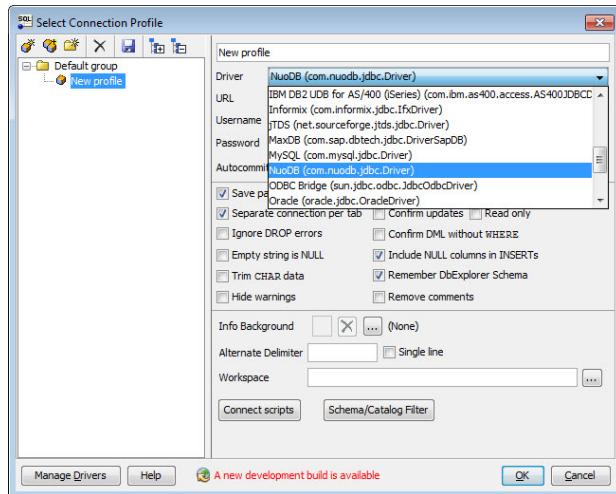
You can see how easy it is to configure NuoDB with the SQuirreL Client and get going with it immediately.

SQL Workbench/J

This is another wonderful client tool, which works very well with NuoDB. The best part is that in the Driver dropdown you will see NuoDB being mentioned there. Click here to download SQL Workbench/J Universal SQL client.

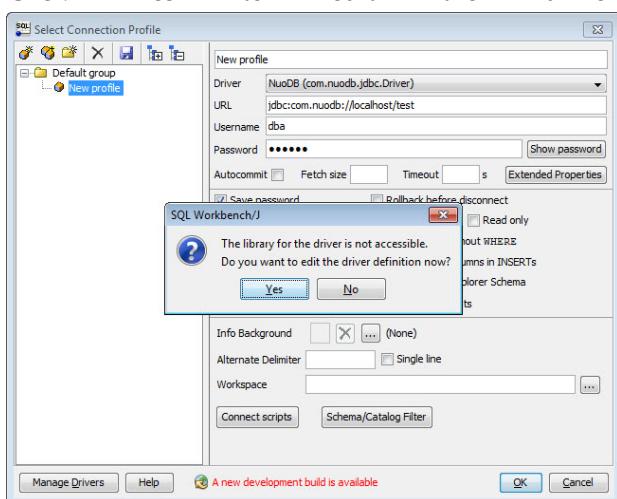
The download process is straight-forward and the installation is a very easy process for SQL Workbench/J. As soon as you open the client, you will notice on following screen the NuoDB driver when selecting a New Connection Profile.

Select NuoDB from the drop down and click on OK.

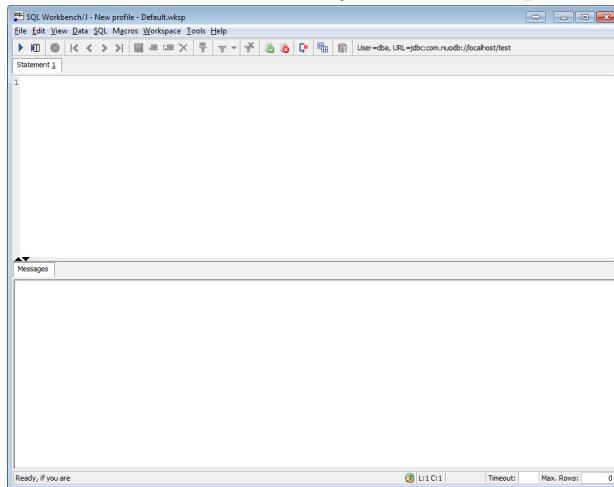


In the driver information, enter following details:
 Driver: NuoDB (com.nuodb.jdbc.Driver)
 URL: jdbc:com.nuodb://localhost/test
 Username: dba
 Password: goalie

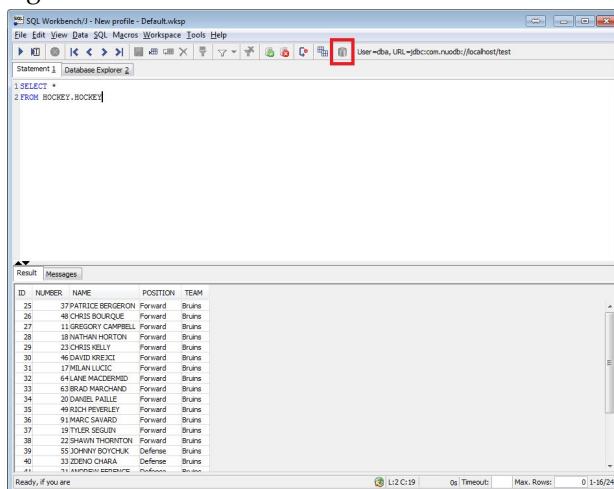
While clicking on **OK**, it will bring up the following pop-up.
 Click **Yes** to edit the driver information.



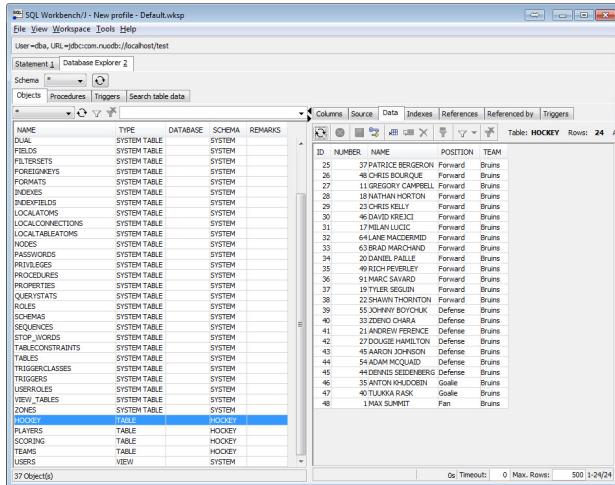
Click on **OK** and it will bring you to following screen. This is the screen where you can perform various tasks.



You can write any SQL query you want and it will instantly show you the results. Now click on the database icon, which you see right on the left side of the word **User=dba**.



Once you click on **Database Explorer**, you can perform various database related tasks.



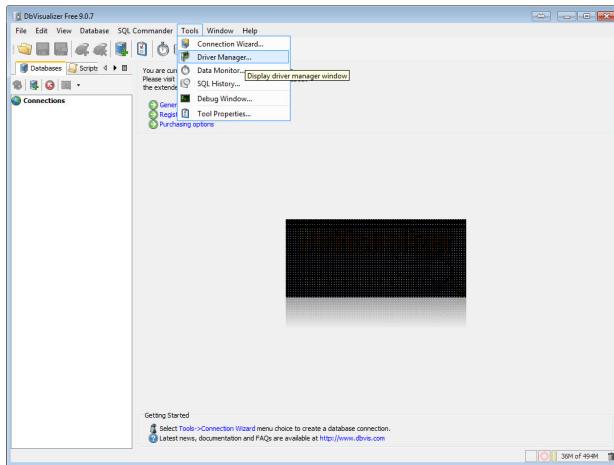
As a developer, one of my favorite tasks is to look at the source of the table as it gives me a proper view of the structure of the database. I find SQL Workbench/J very efficient in doing the same.

DbVisualizer

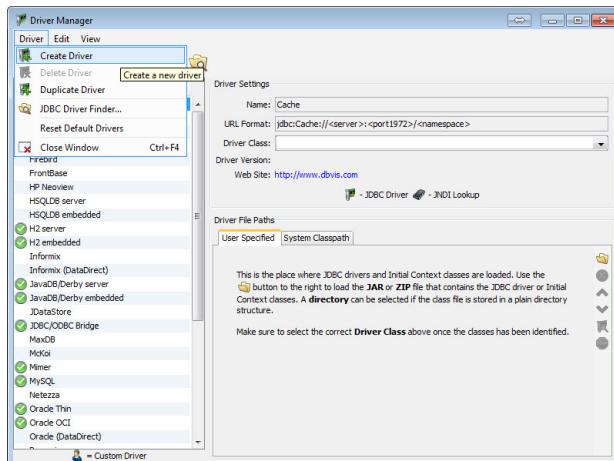
DBVisualizer is another great tool, which helps you to connect to NuoDB and retrieve database information in your desired format. A developer who is familiar with DBVisualizer will find this client to be very easy to work with.

The installation of the DBVisualizer is very pretty straight forward. When we open the client, it will bring us to the following screen.

As a first step we need to set up the driver. Go to **Tools >> Driver Manager**.

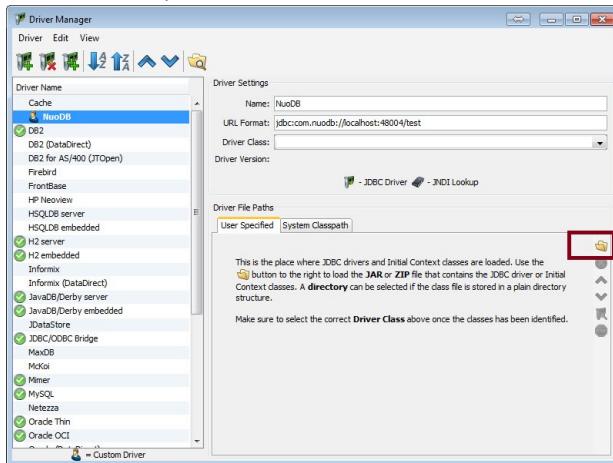


It will bring up following screen where we set up the diver. Click on **Create Driver** and it will open up the driver settings on the right side.

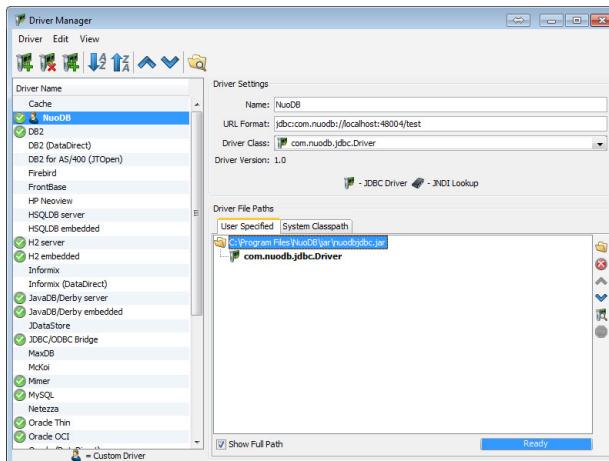


On the right side of the area where it displays **Driver Settings** please enter the following values-
Name: NuoDB

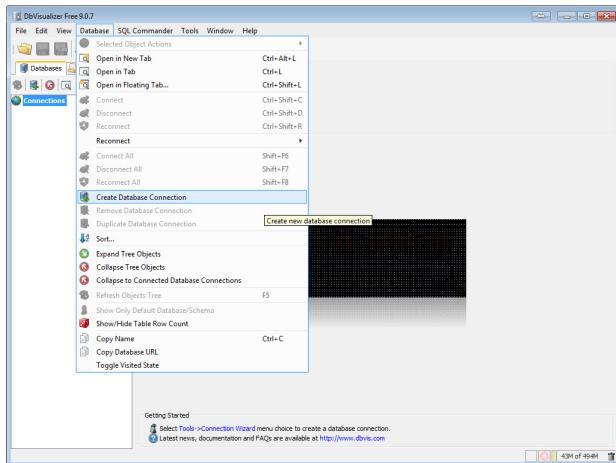
URL Format: `jdbc:com.nuodb://localhost:48004/test`



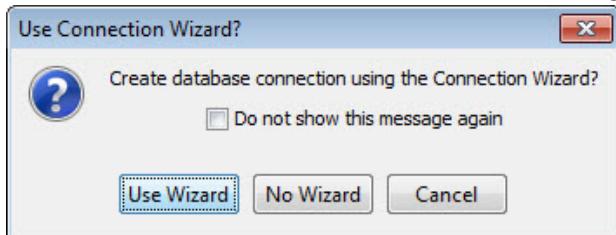
Now under the driver path, click on the folder icon and it will ask for the location of the jar file. Provide the path as a `C:\Program Files\NuoDB\jar\nuodbjdbc.jar` and click **OK**. You will notice there is a green button displayed at the bottom right corner. This means the driver is configured properly.



Once driver is configured properly, we can go to **Create Database Connection** and create a database.



If the pop up show up for the Wizard. Click on **No Wizard** and continue to enter the settings manually.



Here is the Database Connection screen. This screen can be bit tricky. Here are the settings you need to remember to enter.

Name: NuoDB

Database Type: Generic

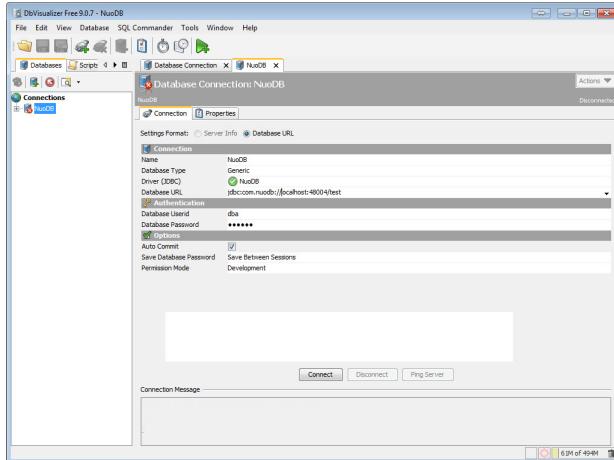
Driver: NuoDB

Database URL: jdbc:com.nuodb://localhost:48004/test

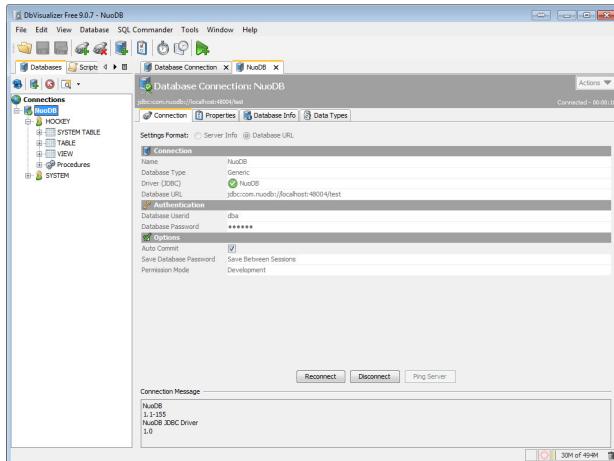
Database Userid: dba

Database Password: goalie

Once you enter the values, click on **Connect**.



Once **Connect** is pressed, it will change the button value to **Reconnect** if the connection is successfully established and it will show the connection details on the left side.



When we further explore the NuoDB, we can see various tables created in our test application. We can further click on the right

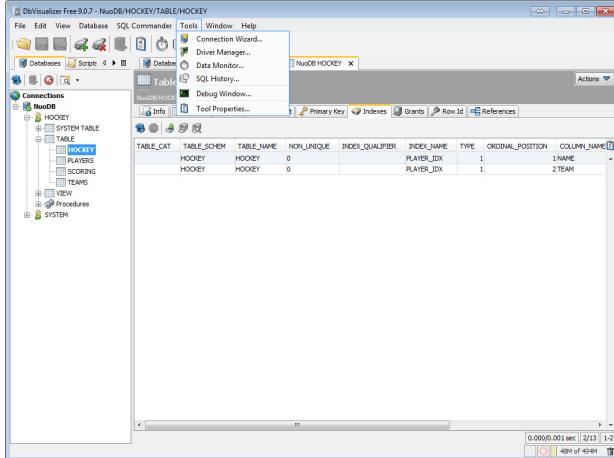
side screen and see various details on the table.

Name	Value
TABLE_CATALOG	HOCKEY
TABLE_NAME	HOCKEY
TABLE_TYPE	TABLE
REMARKS	(null)
VIEWDEFINITION	(null)

If you click on the **Data** tab, it will display the entire data of the table.

ID	NUMBER	NAME	POSITION	TEAM
1	25	37PATRICE BERGERON	Forward	Bruins
2	48CHRIS BOURQUE		Forward	Bruins
3	27	11GREGORY CAMPBELL	Forward	Bruins
4	28	18MATTHEW MARION	Forward	Bruins
5	39	22CHRIS REED	Forward	Bruins
6	30	46DAVID KREJCI	Forward	Bruins
7	31	17MLAN LUCIC	Forward	Bruins
8	32	64LANE MACJARVIS	Forward	Bruins
9	33	53DUSTIN PISTORIO	Forward	Bruins
10	34	20DAVID PALIEL	Forward	Bruins
11	35	49RICH PEIERLSLEY	Forward	Bruins
12	36	91MARC SAVARD	Forward	Bruins
13	37	19TYLER SEGUIN	Forward	Bruins
14	38	22CHRISTOPHER TROTTER	Forward	Bruins
15	39	55JOHNNY BOYCHUK	Defense	Bruins
16	40	33ZDENO CHARA	Defense	Bruins
17	41	21ANDREW LAKATHE	Defense	Bruins
18	42	27DUSTIN HANLTON	Defense	Bruins
19	43	45AARON JOHNSON	Defense	Bruins
20	44	54ADAM MCQUAID	Defense	Bruins
21	45	44DENNIS SEDERBERG	Defense	Bruins
22	46	35ANTON KHUDOBIN	Goalie	Bruins
23	47	42DUSTIN KOLINSKI	Defense	Bruins
24	48	1MAX DUMMETT	Pen	Bruins

The Tools menu also has some very interesting and cool features like Driver Manager, Data Monitor and SQL History.



Summary

Well, this was a relatively long chapter but I find it is extremely essential to cover all the three important clients, which we developers use in our daily database development. Here is my question to you: Which one of the following is your favorite NuoDB 3rd-Party Database Client? (Pick One)

- SQuirreL SQL Client
- SQL Workbench/J
- DbVisualizer



Chapter 6

Final Words

We've investigated some of the amazing features NuoDB offers, and if you currently have a database that is getting a little too big to deal with, you might be completely sold on NuoDB. However, if you still have a smaller database and aren't worried about storage issues yet, should you bother with NuoDB?

You can probably guess that my answer is going to be yes, and here is why: NuoDB is totally scalable. If you're starting out small, start out with NuoDB and skip the transfer later!

NuoDB has zero downtime. That means there is never a power outage, overload, or server malfunction that will interrupt your computing, ever again. Big or small, that is a guarantee everyone could use!

We are operating in an ever-increasing global market. Your clients and customers might span the globe and time zones. NuoDB has "geo-distribution," which means its available everywhere, anytime. There is no need to talk someone through setting up their own server – just send them a link for NuoDB.

NuoDB is a great company. They have produced a great product, and they seem to be really growing. They also support one of my great interests – learning. The NuoDB website hosts webinars and online courses about their product and about SQL Server, databases, and more.

There are so many things to love about NuoDB. We've only covered the highlights here, but the next time you're thinking about server upgrades or what you have to do next, think about NuoDB.



One Last Thing

Five more reasons to love NuoDB:

1. NuoDB works great, every time
2. NuoDB operates “in the Cloud,” keeping it modern and at the front of the market
3. It is backed by solid venture capitalists – good solid companies
4. NuoDB has won multiple industry awards for innovation and excellence
5. Databases are only getting larger and more common – NuoDB and its market are not going away anytime soon!

<http://bit.ly/nuodb-sql>



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