

DB2 UDB SmarTeam Best Practices

**DB2.** Information Management Software

DB2 V8.2 UDB AIX LINUX Windows

***SmarTeam Data Base Creation***

Wednesday, September 05, 2007

**V2.0**

**REVISED & REWRITTEN**  
**FOR DB2 V8.2**

by :

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I would like to thank the persons who participated in the 1<sup>st</sup> version of this paper.

#### The Team that participated in the previous project.

**Alex Bruskin** : Previously was a DB2 application developer and consultant at SmarTeam.

**Guillaume Testelin** : SWG IT Architecture who was giving pre-sales support to the IBM PLM community as well as to numerous business partners .

**Christian Nicolas** : Was PLM and in particular CATIA products specialist and was assigned to the IBM Dassault Systemes competence centre.

**Amr Roushdi**: Data Management expert and providing support for IDSICC , SmarTeam and Dassault Systemes. He is the author of many papers dealing with information management

#### Other contributions

**DB2 Technical Enablement Services IBM Toronto Lab** for providing RDMS terms mapping to DB2

**Paul YIP IBM Toronto lab** for providing DB2 common command line processor commands

**Etienne Landon IDSICC** team leader for his valuable document revision

### Introduction and objectives

This publication is not the replacement of the existing documentation provided for DB2 nor by SmarTeam's documentation and recommendations .

The primary objective of this document is to demonstrate to you how to create the SmarTeam database using the Graphical user interface of DB2 UDB .and the control center taking into consideration different aspects of performance .

The database created is a sample SmarTeam DataBase and by no means is an optimal DataBase definition . It will help you to get started . To have an optimal tuned DataBase based on many factors such as CPU speed , Number of disks used by the Database , Disk technologies , Memory sizes , etc ...These details are covered in the **BASIC SYSTEM ADMINISTRATION** best practices paper as well as **BEST PRACTICES ADVANCED SYSTEM ADMINISTRATION**

***It is assumed that the reader has a basic knowledge of DB2 administration.***

An appendix containing a with different RDBMS Terminology mappings as well as a quick reference for the most db2 clp commands used has been included for your convenience.

For more information on DB2 and or on SmarTeam please refer to the documentation CD's provided .

DB2 UDB documentation are supplied on CD full description of each of the books in the DB2 library is available from the IBM Publications Center at [www.ibm.com/shop/publications/order](http://www.ibm.com/shop/publications/order)

For more information on how to **install DB2** please refer to the following documents

***DB2 UDB SmarTeam Best practices series DB2 installation V8.X***

***DB2 UDB V8.2 Administration***

***DB2 UDB QUICK Beginning Installation for AIX Windows Linux***

**Getting the pieces needed to Create SmarTeam DataBase.**

We assume that at this stage you have successfully installed DB2 UDB either AIX , LINUX or Windows.

The latest DB2 level certified at this point in time is DB2 8.2 which is in fact DB2 V8.1 with FIXPAK 7 installed . You should install the DB2 product with its fixpaks before continuing .

To know your level of DB2 installed issue the command **db2level** from a command shell . You should get an output similar to this

FOR Windows :

```
C:\Documents and Settings\db2inst1>db2level
DB21085I Instance "DB2" uses "32" bits and DB2 code release "SQL08020" withlevel
identifier "03010106". Informational tokens are "DB2 v8.1.7.445", "s040812", "WR21342",
and FixPak
"7".
Product is installed at "C:\PROGRA~1\IBM\SQLLIB".
```

FOR AIX & LINUX

```
v5r16-iccp5501:/home/v5r16 # db2level
DB21085I Instance "v5r16" uses "32" bits and DB2 code release "SQL08020" with
level identifier "03010106". Informational tokens are "DB2 v8.1.1.64", "s040812",
"U498350", and FixPak "7".
Product is installed at "/usr/opt/db2_08_01".
```

Several steps will be performed by using the DB2 control center.

The Control center can be installed in the server and or in the client .

\* **NOTE.** For AIX or LINUX you might need an Xstation or equivalent Xstation emulator on Windows (Xfree86 , HclExceed, VNC etc ..) .

### Security requirement Windows reminder :

A user account that will be used to perform the installation.

The account you are logged in must:

Be defined locally



Belong to the Local Administrator's group

Have the following advanced user rights:

*Act as part of the operating system*

*Create token object*

*Increase quotas*

*Replace a process level token*

**NB:** You can perform the installation without these advanced user rights, but the setup program will be unable to validate accounts. We recommend that any user account used to install this product have these advanced user rights.

During installation, you will provide a user account that will be used by the DB2 Administration Server to log on to the system and to start itself as a service. The account you specify must be defined locally and belong to the Local Administrator's group.

By default, the setup program will create a user account using the username db2admin and the password that you specify. You can accept the default user account, create your own user account by modifying the default values, or provide your own. If you create or provide your own user account, ensure that it conforms to DB2's naming rules.

To verify that DB2 installed correctly, you will need to have a user account that belongs to the DB2 System Administrative (SYSADM) group. The account name must comply with DB2's naming rules, as described in Username, User ID, Group Name, and Instance Name Rules. By default, any user that belongs to the Local Administrators group, on the local machine where the account is defined, has SYSADM authority on the instance. For more information, see Working with the System Administrative Group. For more information on valid DB2 usernames, see Appendix E, Naming Rules in the quick beginning guide .

### **LDAP Considerations :**

During the installation, you may also be prompted for user names and passwords for the products and services that you install.

If you want to use LDAP with Windows 2000, you must extend the directory schema to contain DB2 object classes and attribute definitions. You must do this once, before you install any DB2 product.

To extend the directory schema, execute the db2schex.exe program from the installation CD with Schema Admins authority. You can execute this program with Schema Admins authority, without logging off and logging on again, as follows:



runas /user:MyDomain\Administrator x:\db2\common\db2schex.exe

where x: represents the CD-ROM letter.

When db2schex.exe completes, you can continue with the installation.

**WINDOWS only securing DB2 objects . ( Standard security UNIX functions)**

You may activate the security either during the install of the product or subsequently with the fixpack . If you do not know how to manipulate groups and user skip the activation for the moment.

NOTE

**PDF DOCUMENT with LIVE LINKS**

## Starting the SmarTeam Database creation .

### Preparing the Control Center

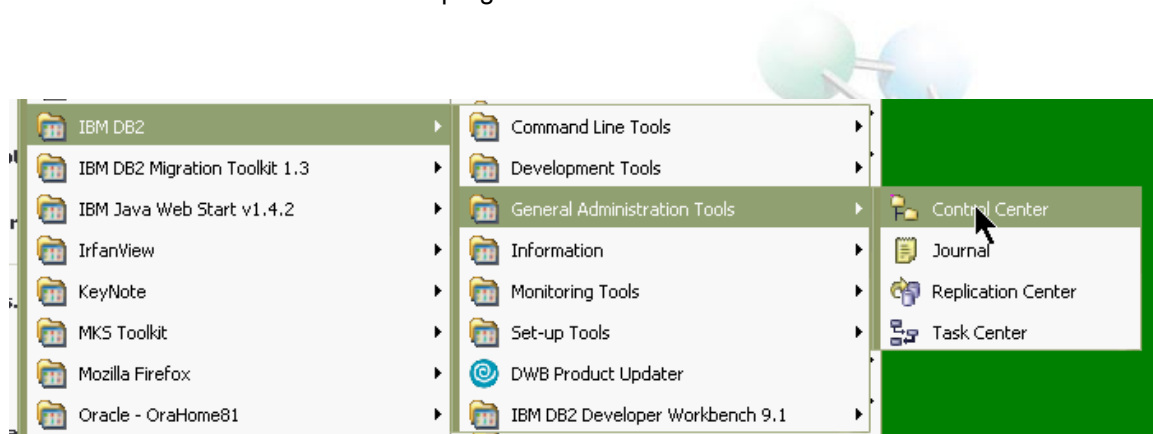
The procedure to start the control center differs from platform to platform .

**AIX** : logon as the instance owner and issue **db2cc**

**Windows** logon as the db2administrator . You have 2 choices here :

From a command line window issue **db2cc**

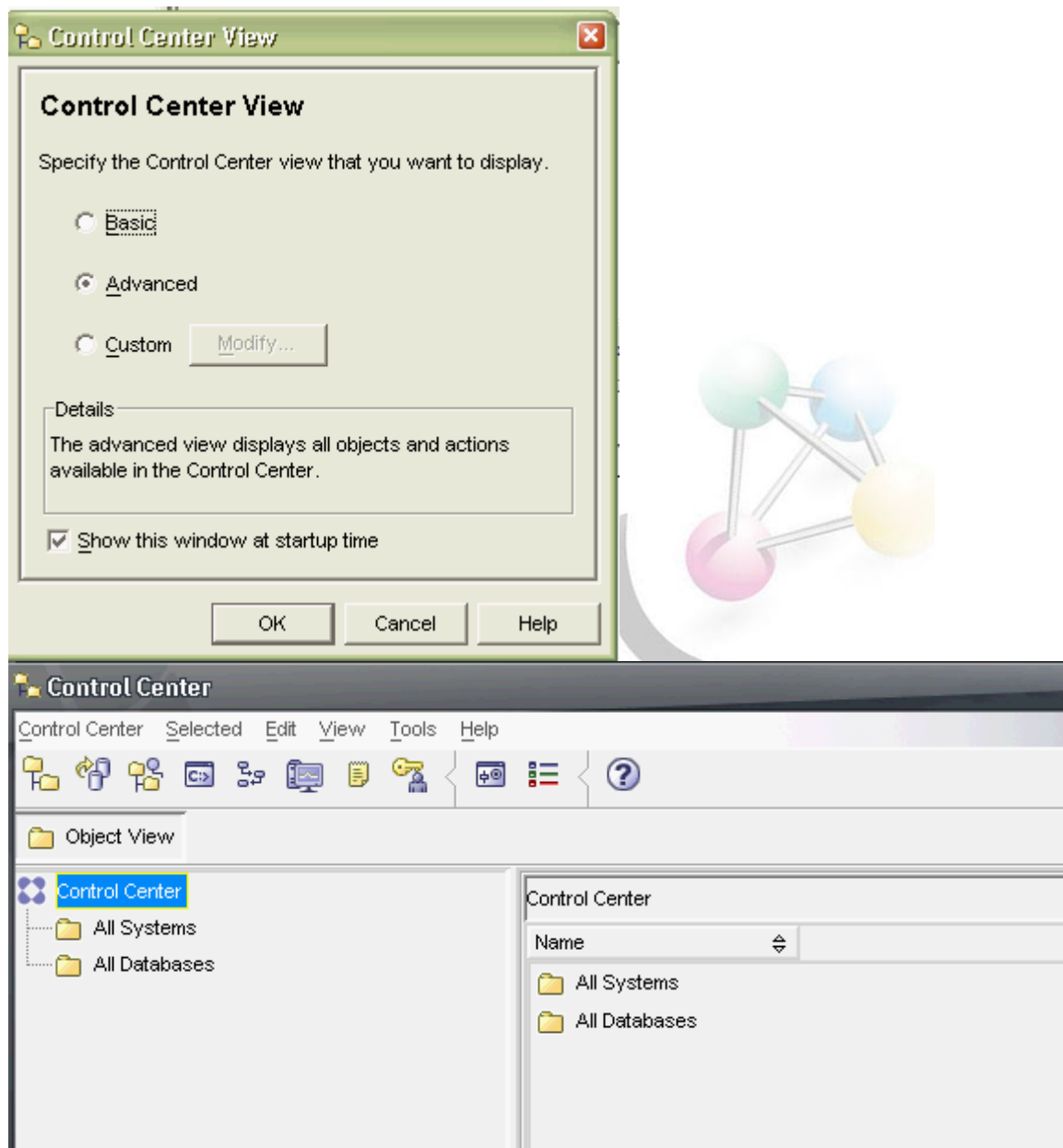
From the task bar ☐ start ☐ programs ☐ db2 ☐ Admin tools ☐ Control center .



You will get the control center application



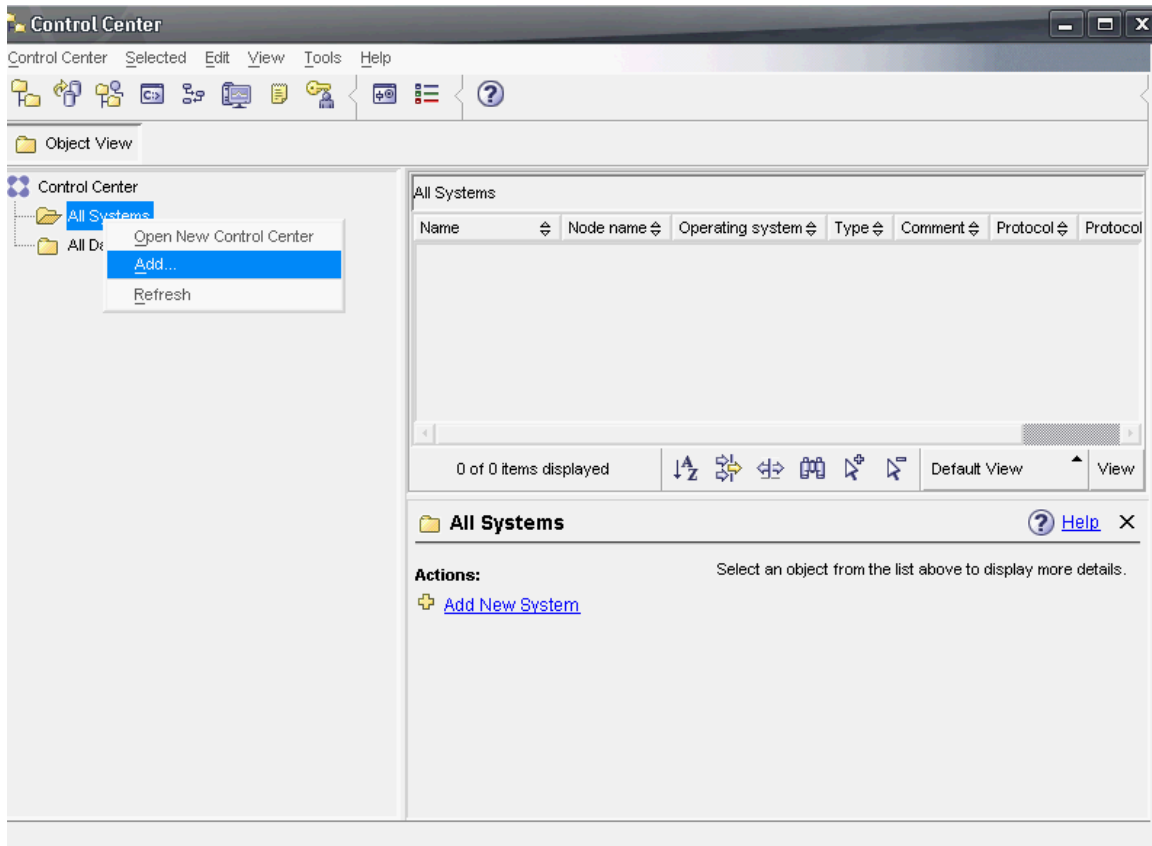
or from the taskbar on your right hand



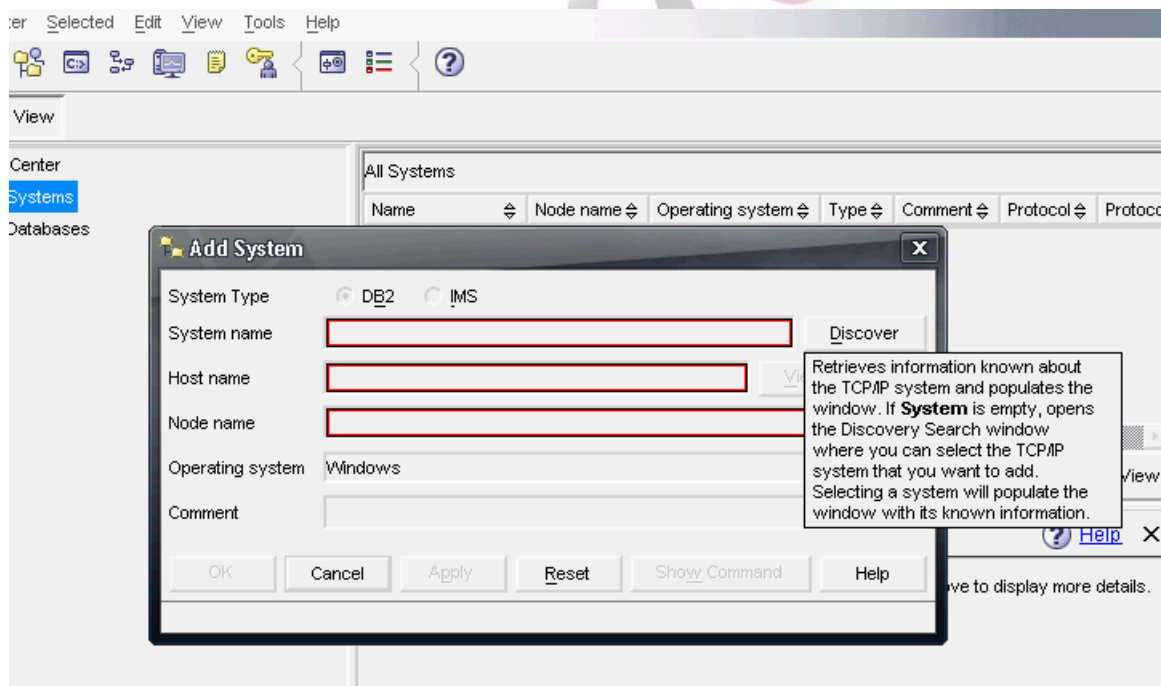
The basic view is the 8.1 view and you get only systems view. You can as well customize it to show only the needed information .

If your instance is not visible ( remote client ) . You have to add it . Before doing that you add the system which hosts the instance, click with the right button on systems and select add

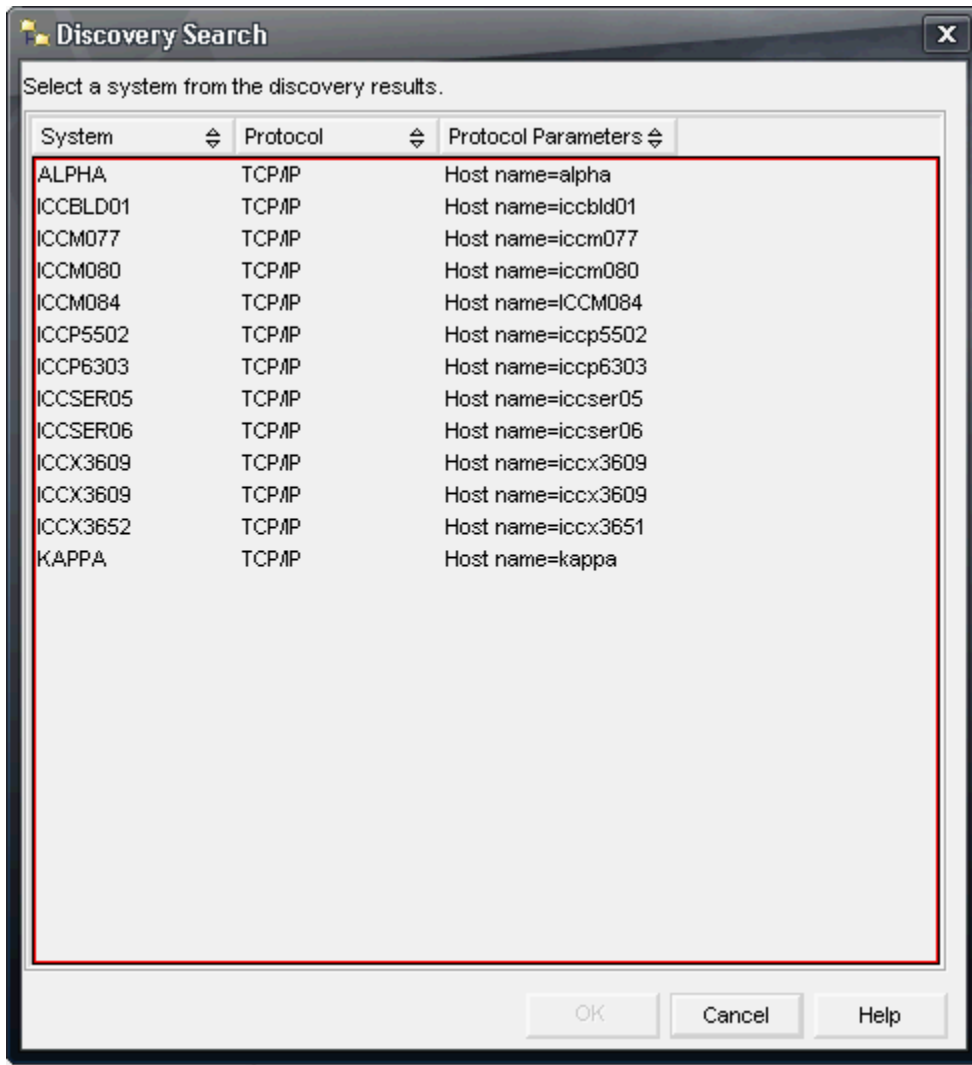
**NOTE : In case You cannot connect to the host . MAKE SURE THAT ALL HOSTNAMES ARE RESOLVED .**



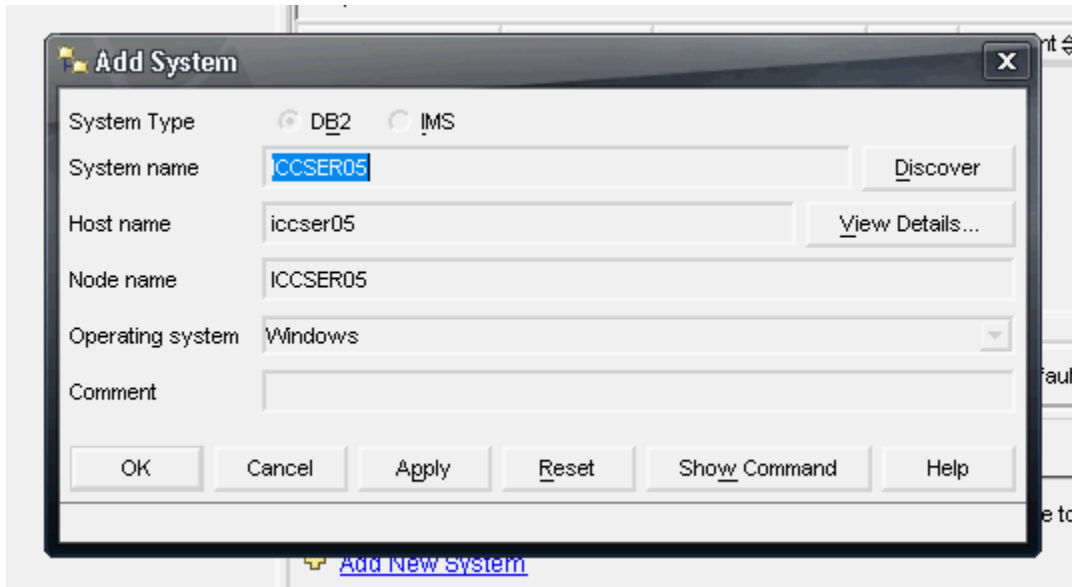
You will be presented with the following:



Press the **discover** button to let DB2 search and discover through the network for visible systems with DB2 running. Depending on your network size DB2 will respond after a certain amount of time with the following dialogue to select the system containing the desired instance by pressing the right arrow of the dialogue.



After you make the selection press **OK**



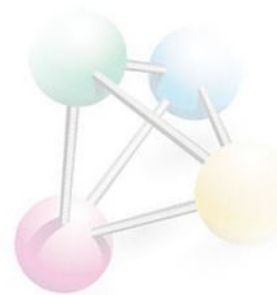
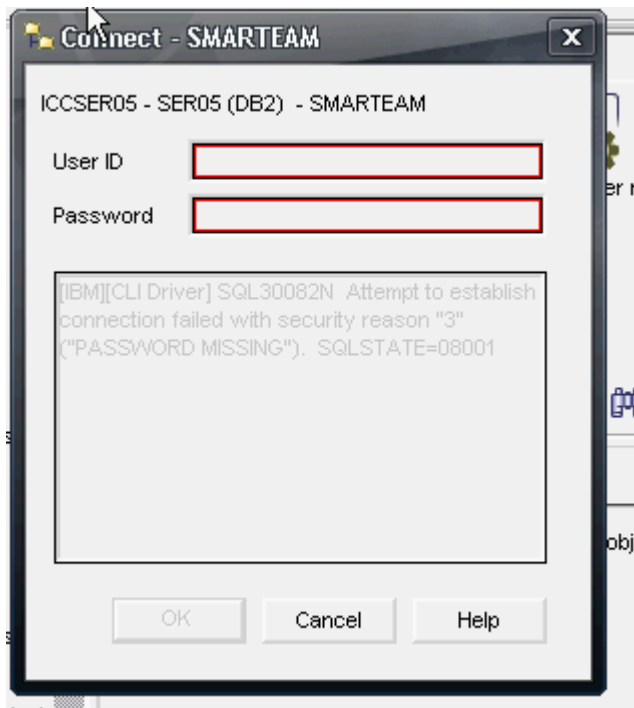
The image shows a screenshot of the 'Add System' dialog box in a software application. The dialog box has a title bar with a close button (X). It contains several fields and buttons:

- System Type:** Two radio buttons, 'DB2' (selected) and 'IMS'.
- System name:** A text field containing 'ICCSER05' with a 'Discover' button to its right.
- Host name:** A text field containing 'iccsr05' with a 'View Details...' button to its right.
- Node name:** A text field containing 'ICCSER05'.
- Operating system:** A dropdown menu showing 'Windows'.
- Comment:** An empty text field.
- Buttons:** At the bottom, there are six buttons: 'OK', 'Cancel', 'Apply', 'Reset', 'Show Command', and 'Help'.

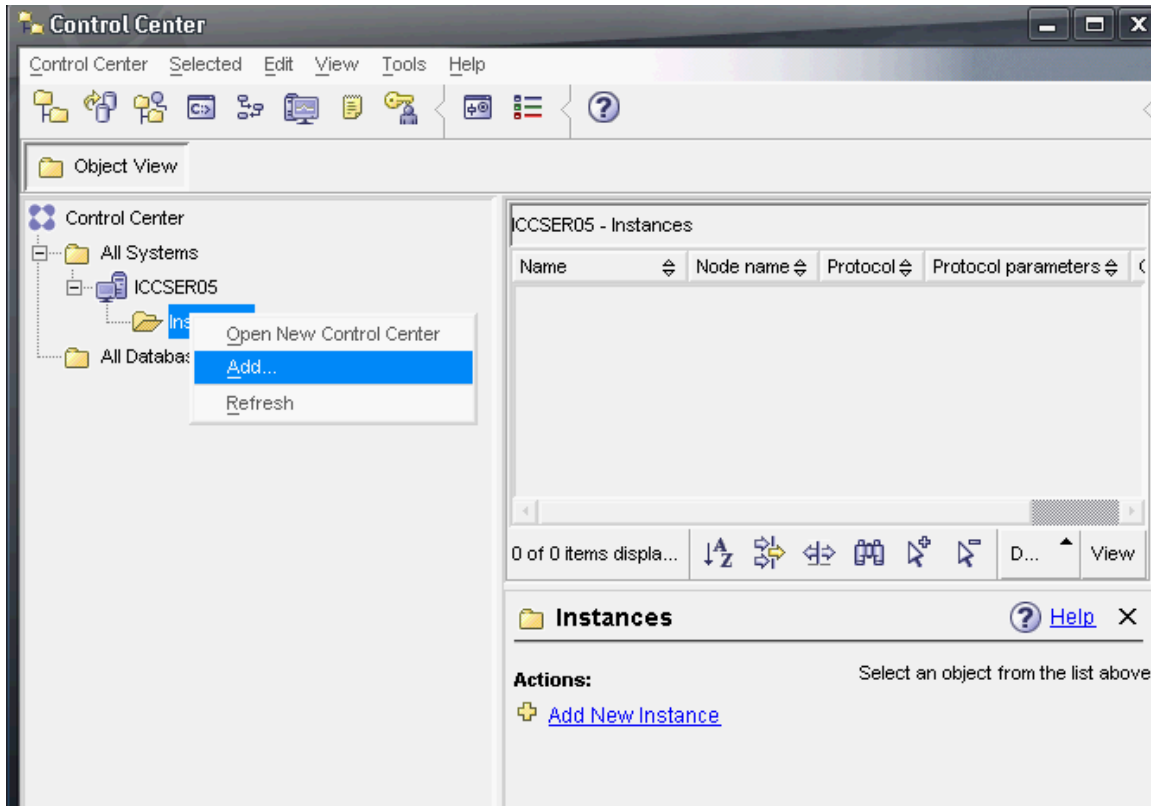
Below the dialog box, there is a link that says 'Add New System'.

Depending on the user name logged you might be presented with a prompt to logon on the system ( you should logon as the instance owner )

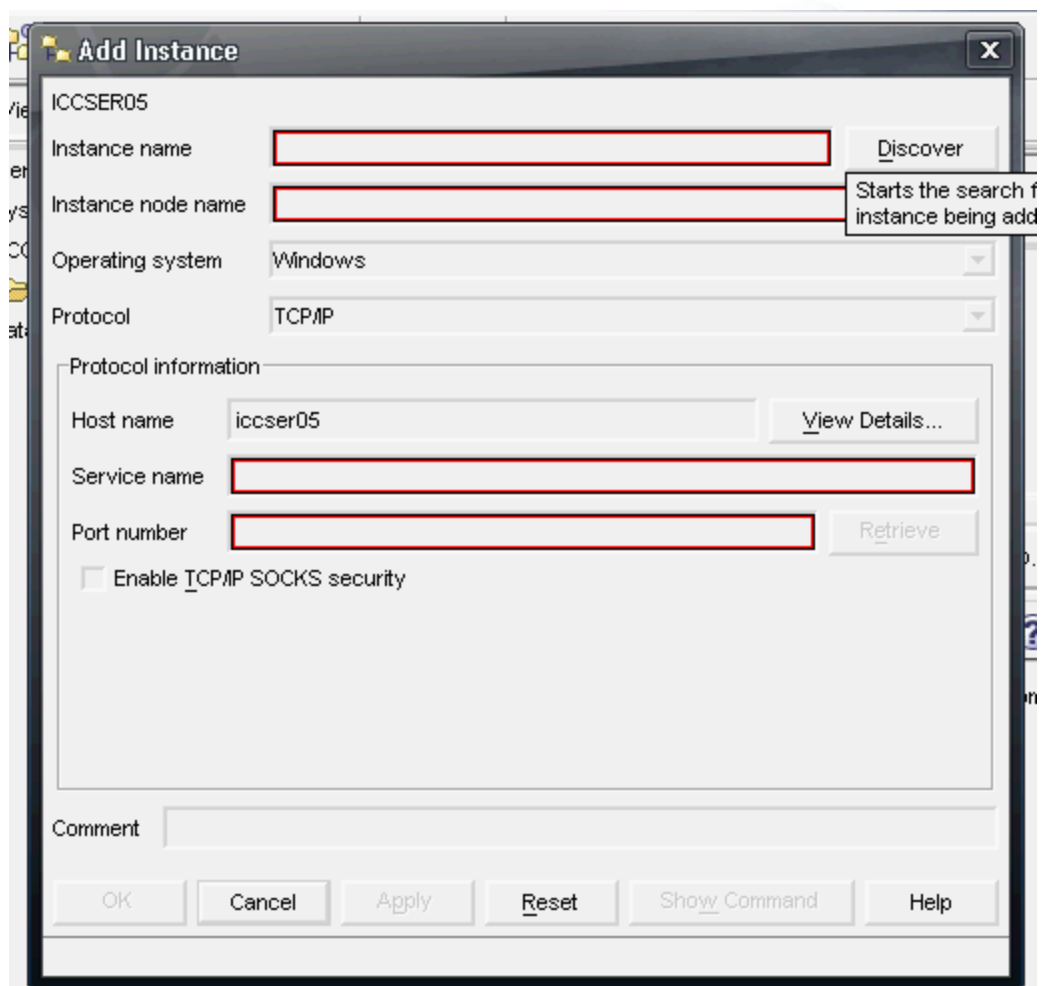




Once successfully logged in we have to select which instance to use. DB2 can run multiple instances on a single host and as well an instance can have multiple databases.



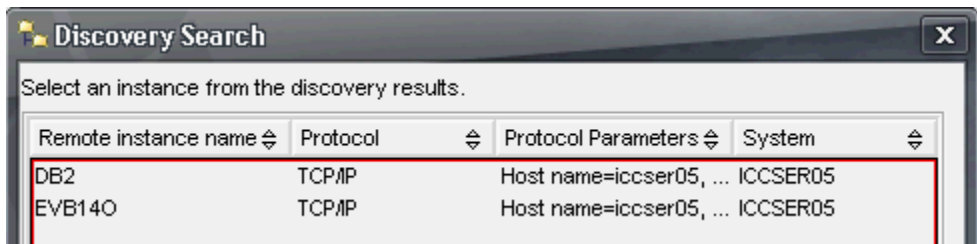
On instances we click the right button and select add



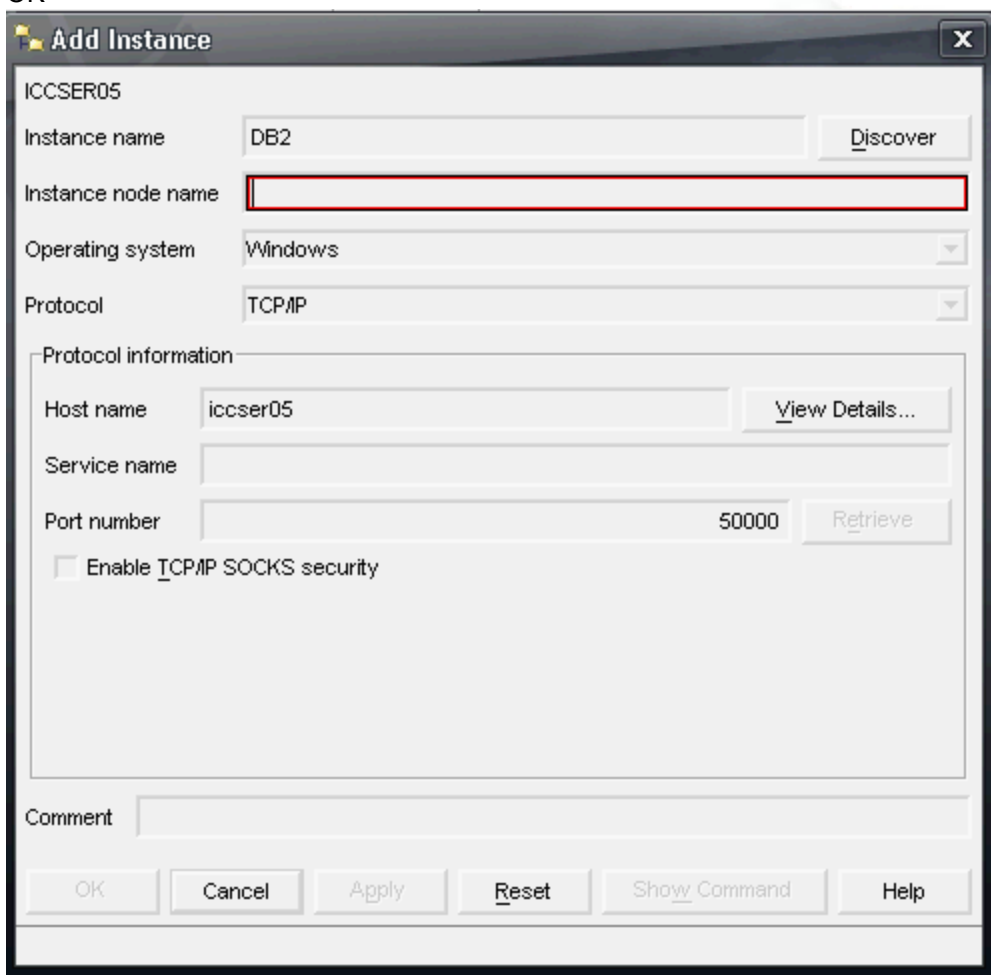
The 'Add Instance' dialog box is shown. It contains the following fields and controls:

- Instance name:** A text field with 'ICCSER05' entered.
- Instance node name:** An empty text field.
- Operating system:** A dropdown menu set to 'Windows'.
- Protocol:** A dropdown menu set to 'TCP/IP'.
- Discover:** A button next to the 'Instance node name' field. A tooltip points to it with the text: 'Starts the search for instance being added'.
- Protocol information section:**
  - Host name:** A text field with 'iccs05' entered.
  - Service name:** An empty text field.
  - Port number:** An empty text field.
  - View Details...:** A button next to the 'Host name' field.
  - Retrieve:** A button next to the 'Port number' field.
  - Enable TCP/IP SOCKS security:** An unchecked checkbox.
- Comment:** A text area at the bottom.
- Buttons:** OK, Cancel, Apply, Reset, Show Command, and Help at the bottom.

We press **discover** to let DB2 get the instance names



DB2 will list all instances discovered at the specific host . Select the desired one you and press OK



Give any name to the node name . The node name is significant when we have the DPF feature installed which is not the case .

**Add Instance** [X]

ICCSER05

Instance name: DB2 [Discover]

Instance node name: SER05

Operating system: Windows [v]

Protocol: TCP/IP [v]

Protocol information:

Host name: iccser05 [View Details...]

Service name: [v]

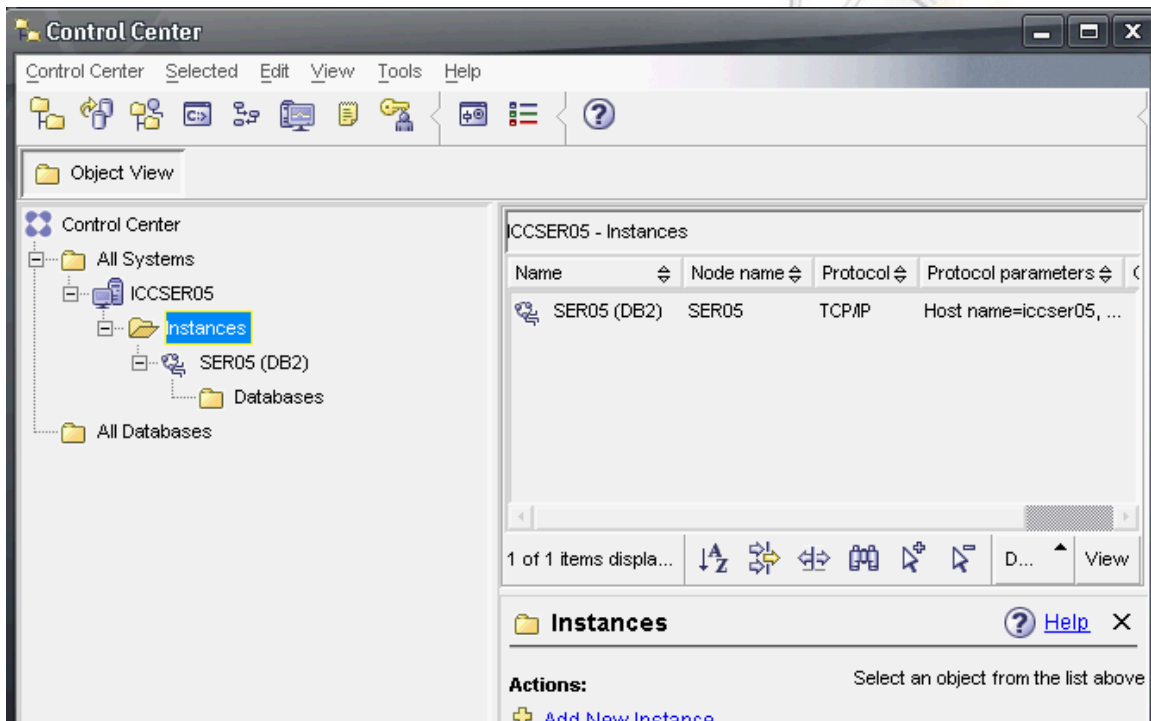
Port number: 50000 [Retrieve]

☐ Enable TCP/IP SOCKS security

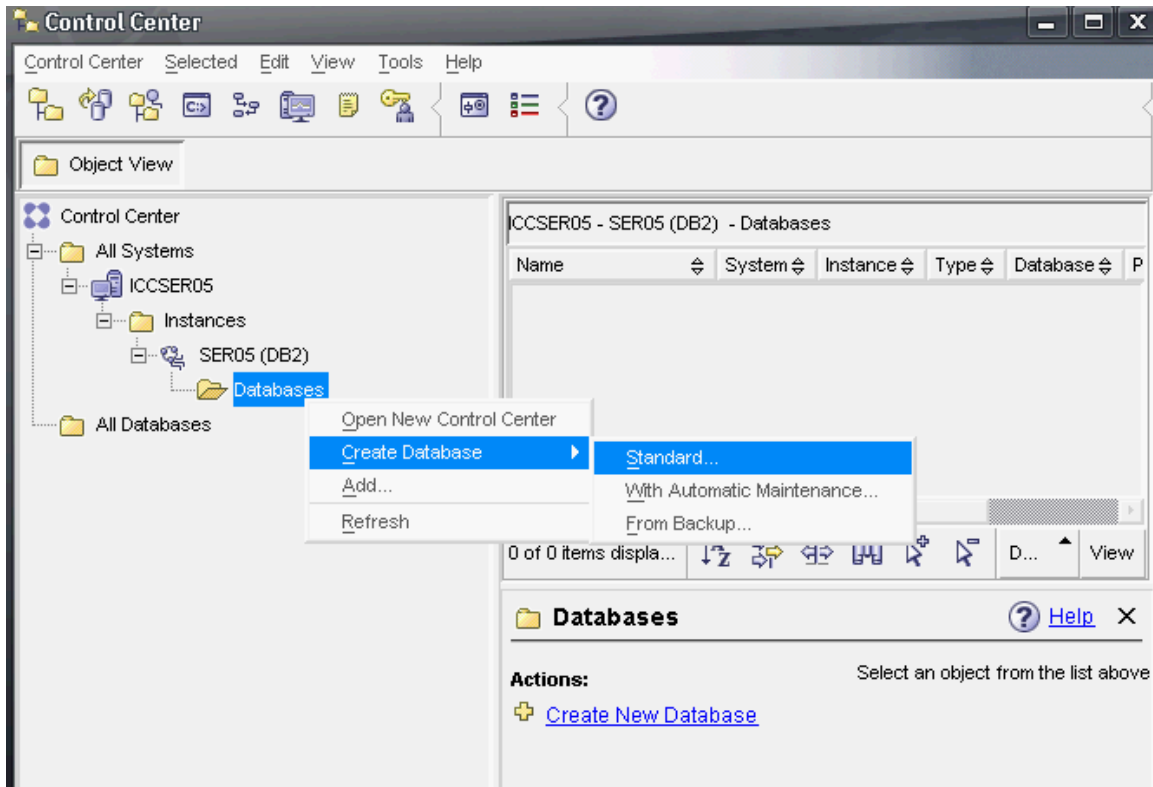
Comment: [v]

[OK] [Cancel] [Apply] [Reset] [Show Command] [Help]

Once we have the database folder appearing we are ready to create the database.



## Creating the SmarTeam db2 database

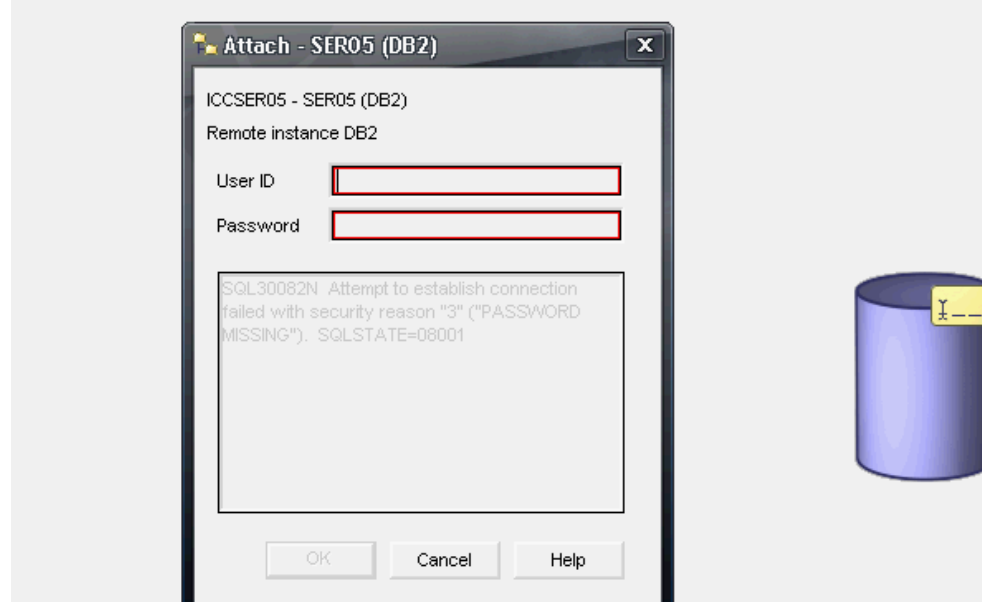


Now we click on the right button , select create and then select Database using the Wizard. The wizard will assist you to create the database suited to your requirements . Supply the name of the DB.

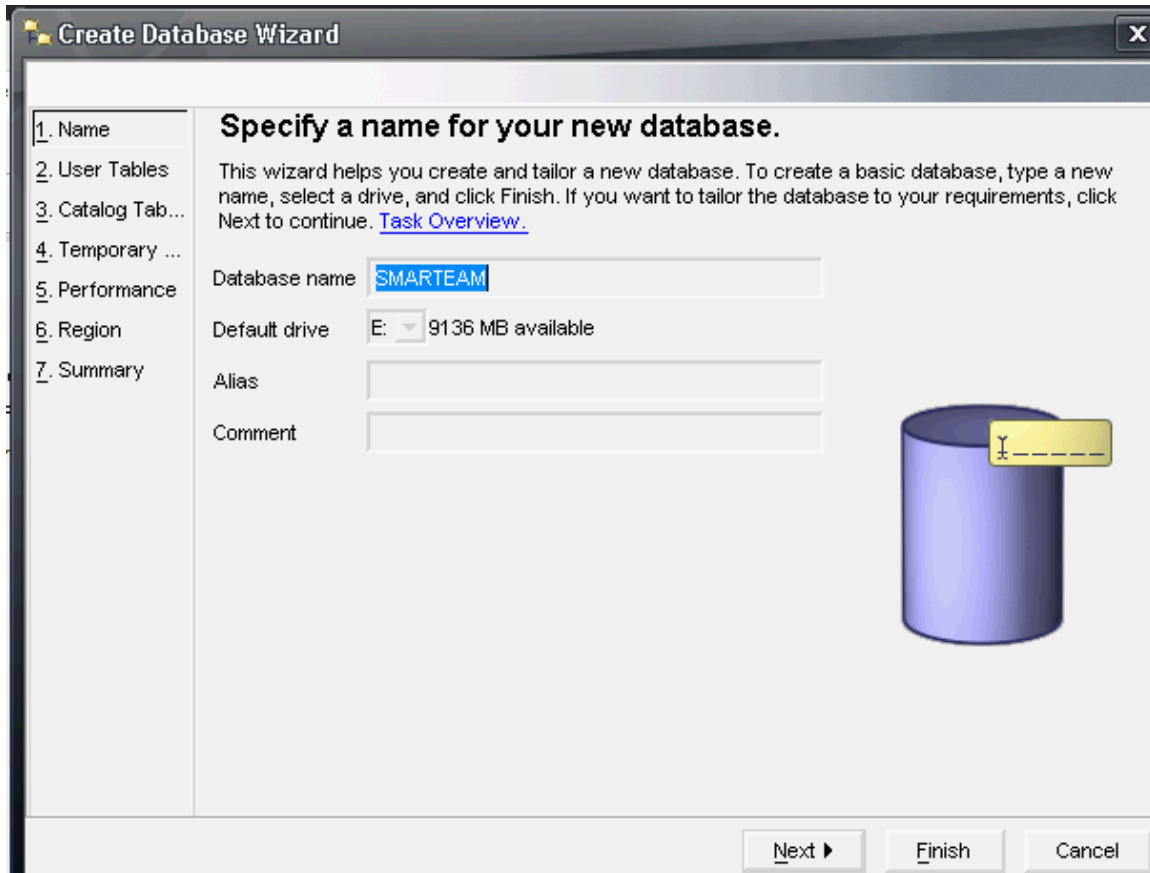


## Give a name for your new database.

SmartDB helps you create and tailor a new database. To create a basic database, type a new name, select a drive, and click Finish. To tailor the database to your requirements, click Next to continue. [Task Overview](#).



Under certain circumstances you might be asked to log on again ( in case of remote client ) and DB2 will attach the user to the instance. That is to say acting on behalf of the instance



Enter the name of the database

## Windows only

DB2 requires a default drive to create the default system catalogues . In the above case we chosen "E:\"

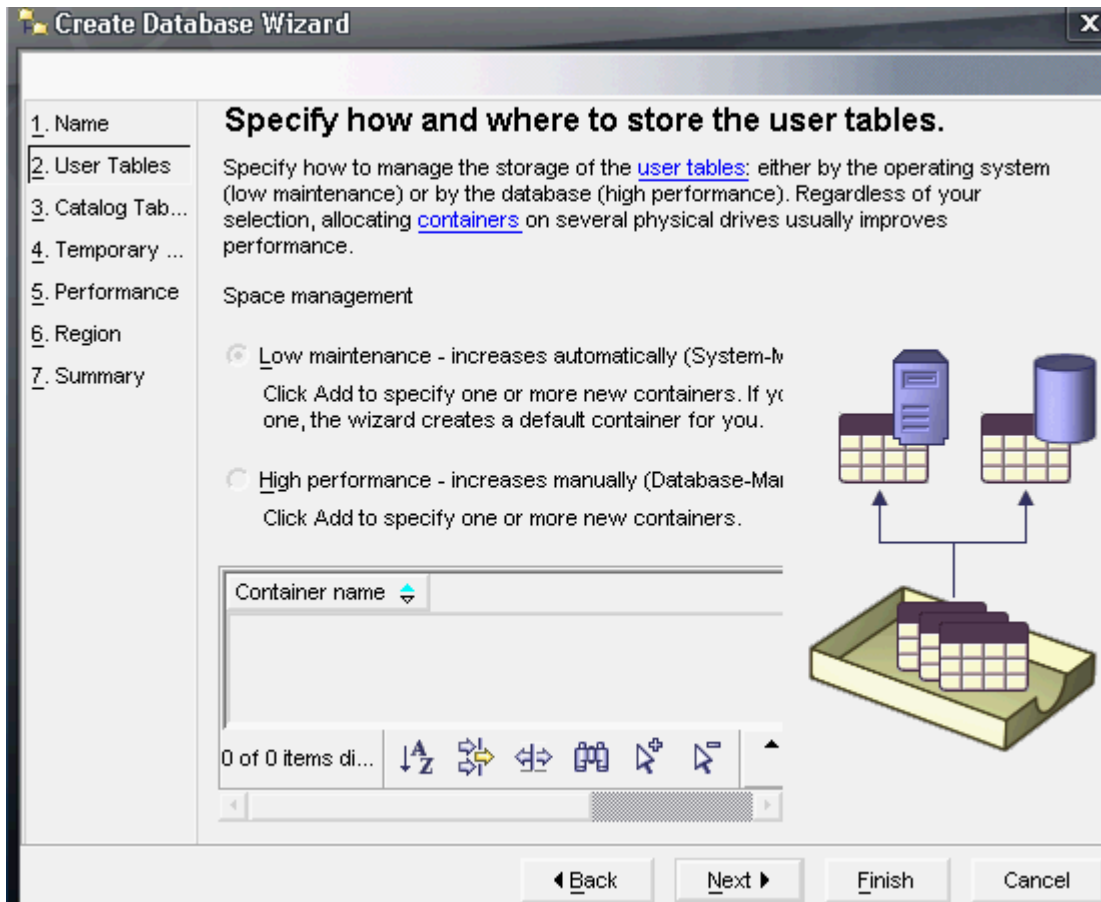
## AIX & LINUX Flavors

DB2 requires a default path to create the default system catalogues .

## Performance considerations :

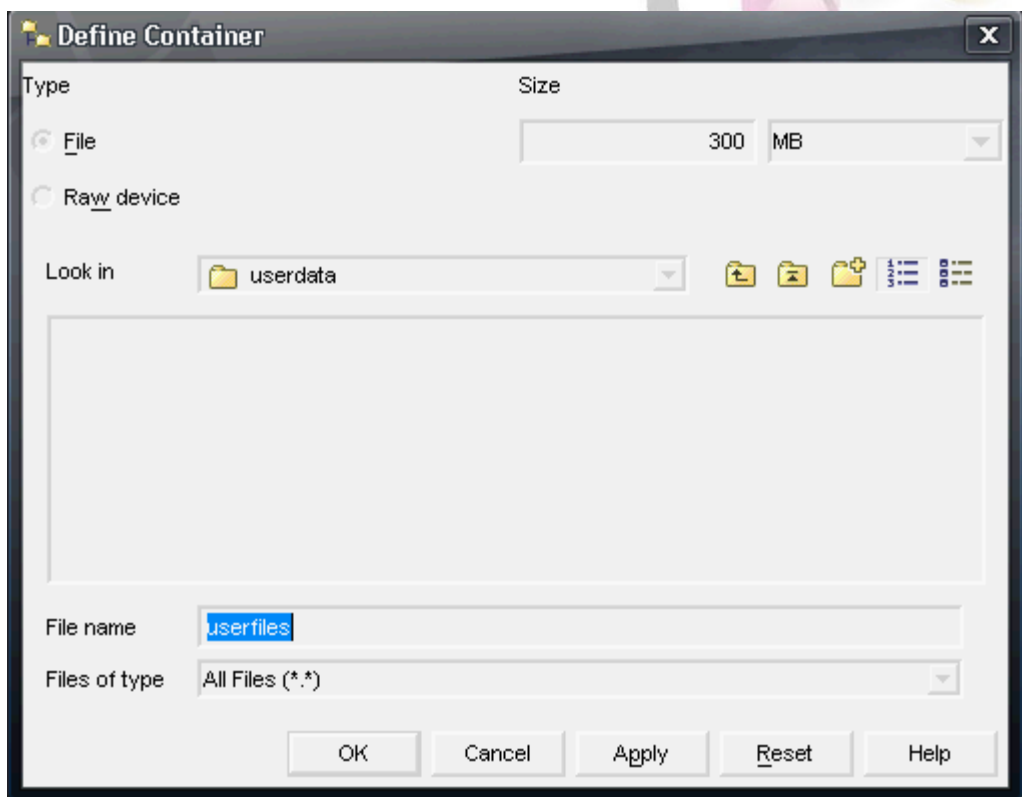
It is recommended to spread the DB2 files on different physical drives and avoid paging devices , system devices to improve performance . Moreover all DB2 file systems should be spread among different physical disks.

Refer to SmarTeam advanced tuning guide for further information.

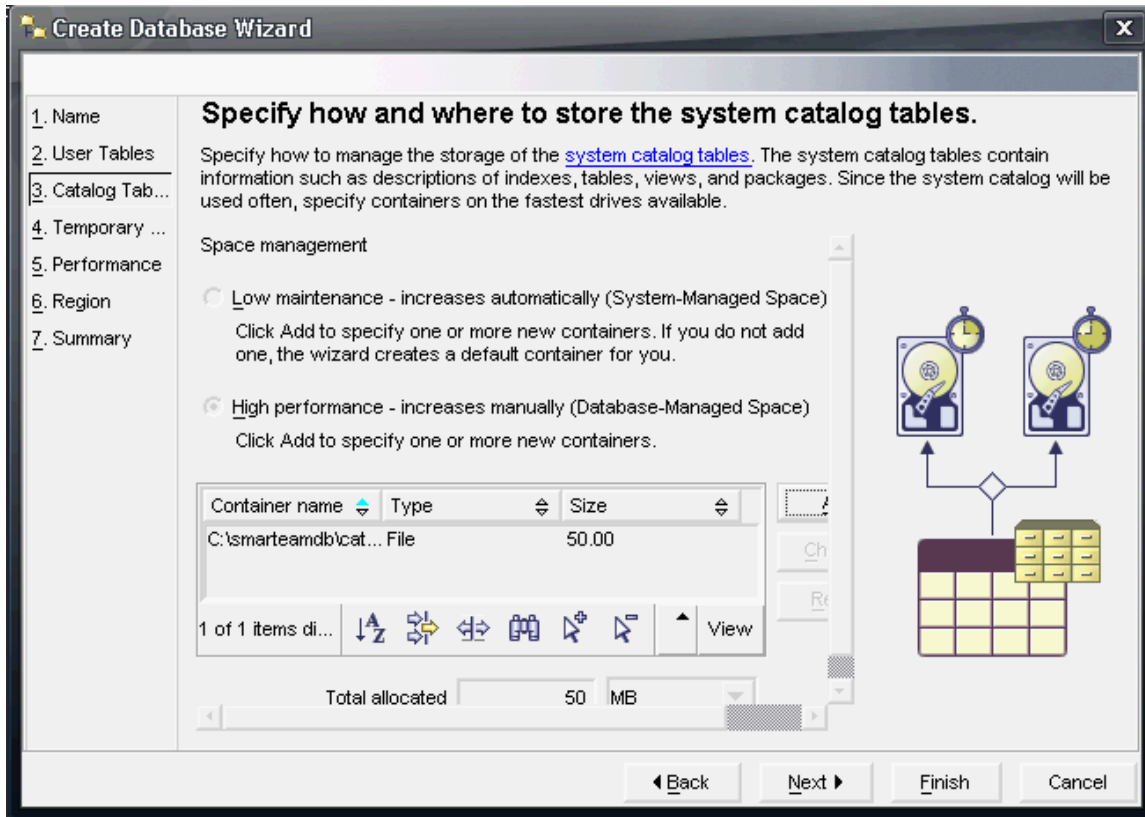


Select High performance , Press add

you will be prompted to add a container and specify the size of the container  
Specify a container with the name you choose and the **size of 300 MB** and press enter

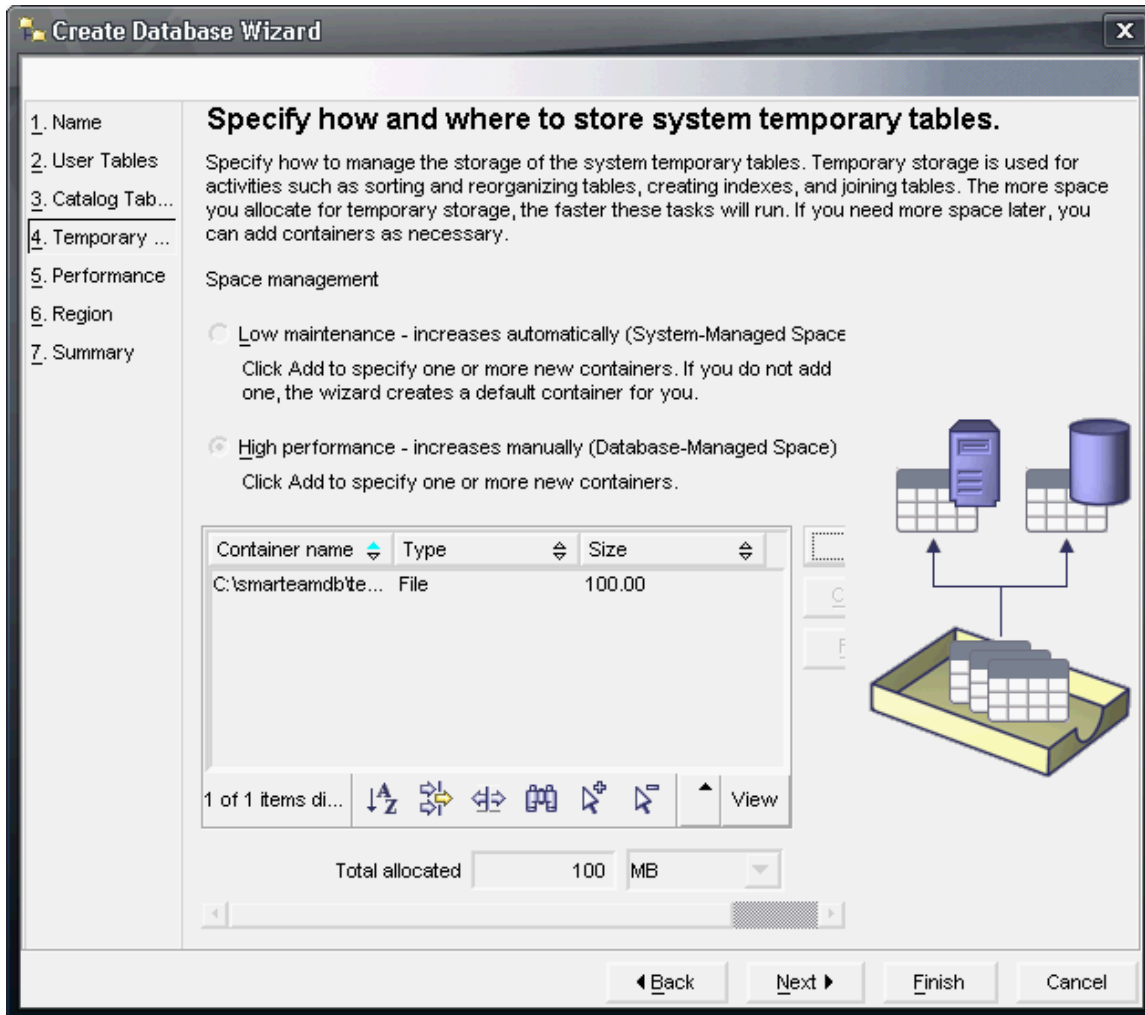


Enter the file name



Select High performance and Press add and you will be prompted to add a container and specify the size of the container

Specify a container with the name you choose and the size of 50 MB and press enter



Accept the default and press next 100MB should be sufficient for most cases .

**Create Database Wizard**

1. Name  
2. User Tables  
3. Catalog Tab...  
4. Temporary ...  
**5. Performance**  
6. Region  
7. Summary

## Tune the performance of this database.

To change how the database reads and writes data, click Change in the Read/Write specifications group. To optimize how the database uses its available hard drives, click Change in the Drive specifications group. If necessary, you can change any of these parameters later except for the extent size.

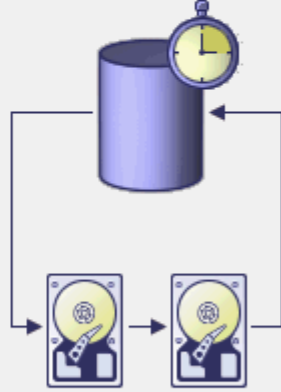
☒ Allow DB2 to update table space prefetch size automatically.  
☐ Specify a prefetch size value for this table space.

Read/Write specifications

Extent size 16 4KB pages [Change...](#)  
Prefetch size 16 4KB pages

Drive specifications

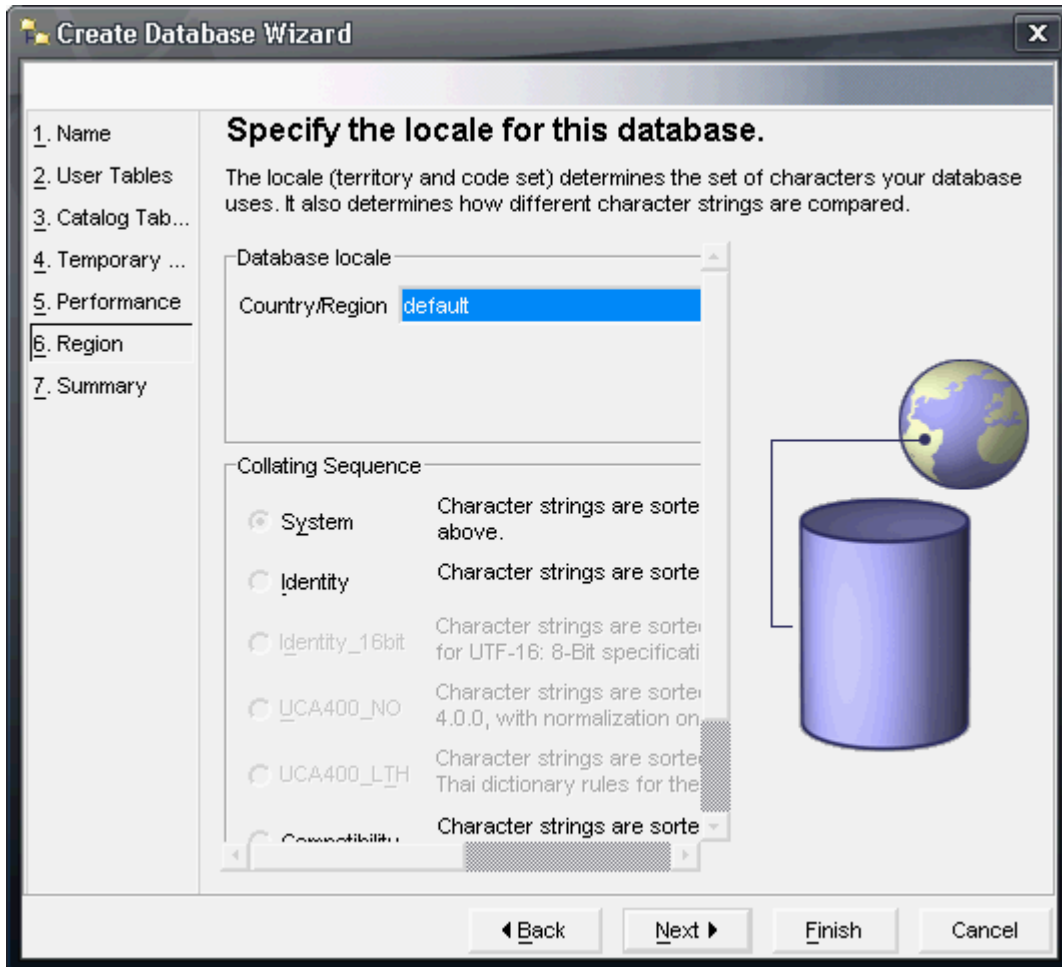
Drive	Overhead	Transfer
C:	10.5	0.14



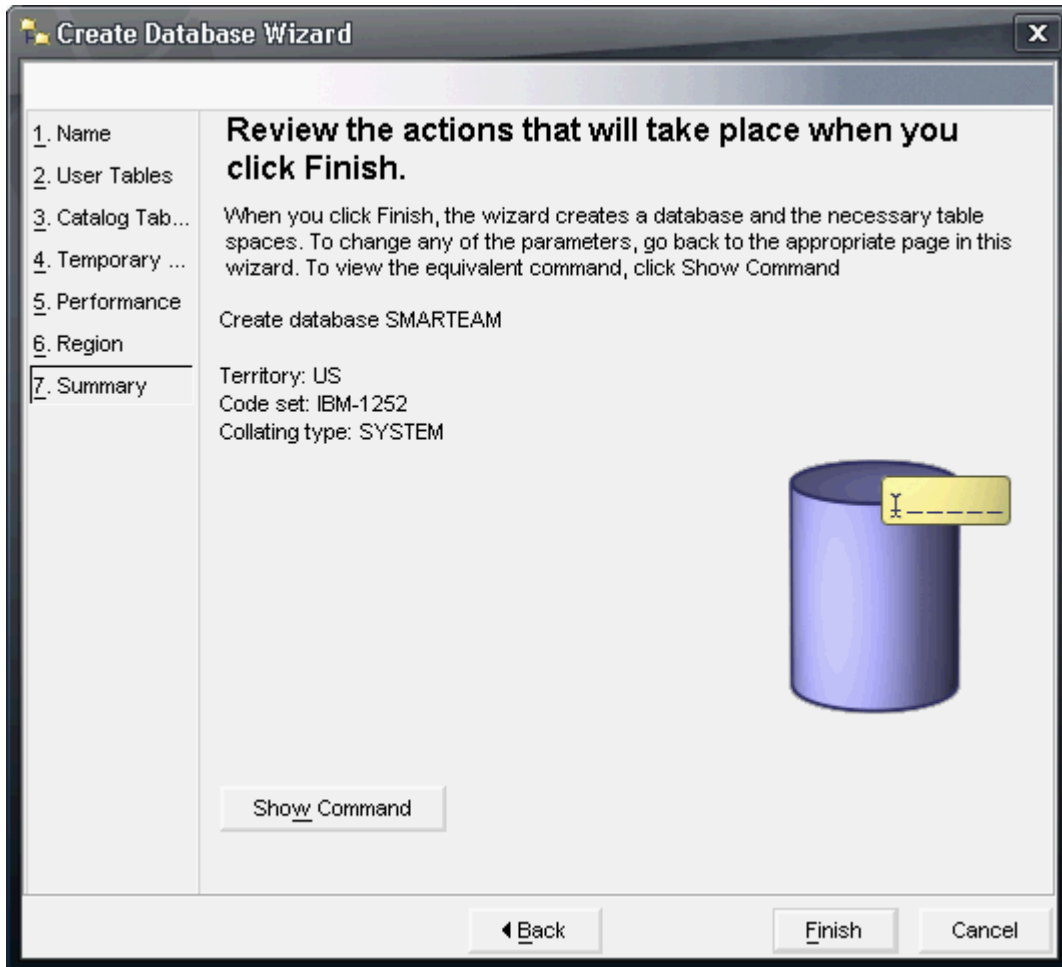
◀ Back   Next ▶   Finish   Cancel

Accept the results shown which are taken from the device characteristics.



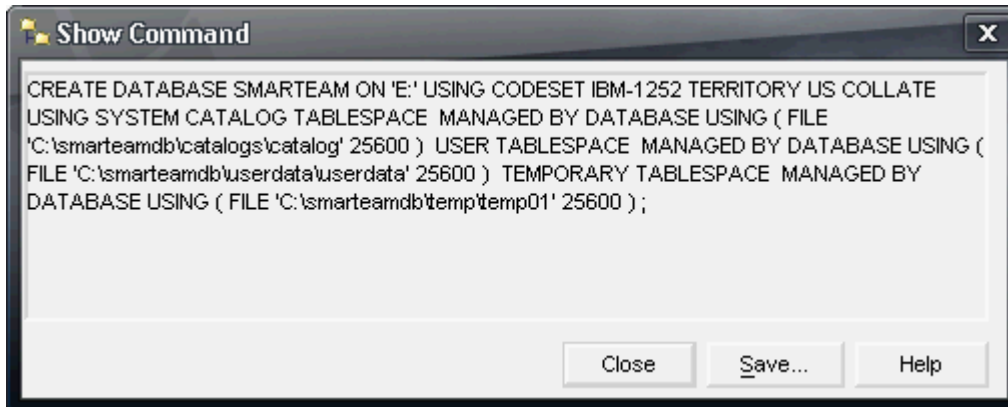


We select the language and territory as well as the code set . We have chosen the **default** US English as code set 1252 .



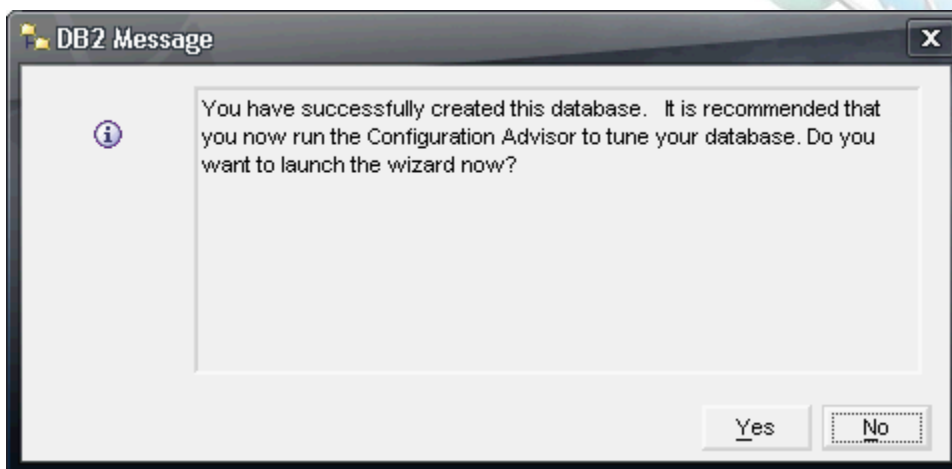
The final step is to review what has been defined so far . We can see the SQL code generated by pressing the show command button . Quite useful to save if we need to recreate the data base or include it in a script

Click on **finish** to create the database.



A screenshot of a 'Show Command' dialog box. The title bar says 'Show Command' with a close button. The main area contains a SQL command to create a database. At the bottom are 'Close', 'Save...', and 'Help' buttons.

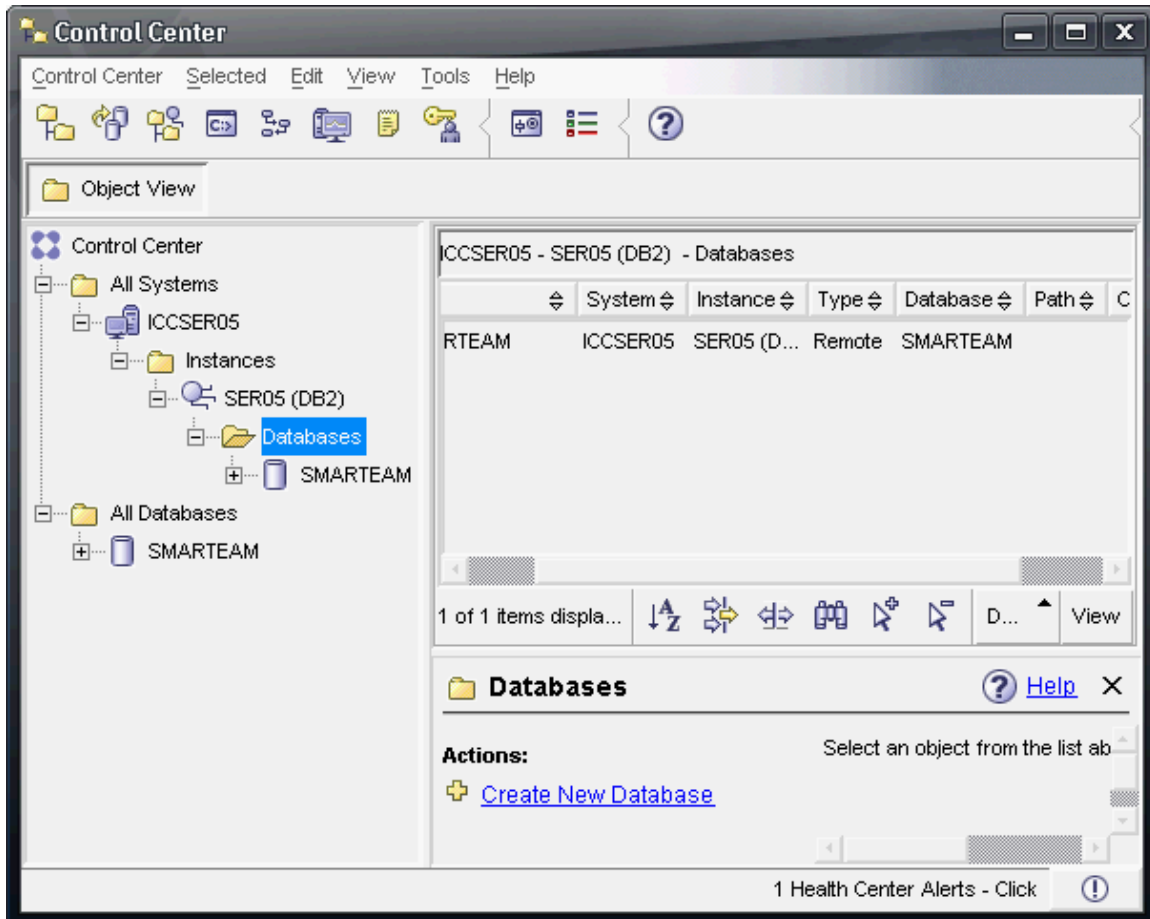
```
CREATE DATABASE SMARTEAM ON 'E:' USING CODESET IBM-1252 TERRITORY US COLLATE  
USING SYSTEM CATALOG TABLESPACE MANAGED BY DATABASE USING ( FILE  
'C:\smarteamdb\catalogs\catalog' 25600 ) USER TABLESPACE MANAGED BY DATABASE USING ( FILE 'C:\smarteamdb\userdata\userdata' 25600 ) TEMPORARY TABLESPACE MANAGED BY  
DATABASE USING ( FILE 'C:\smarteamdb\temp\temp01' 25600 );
```



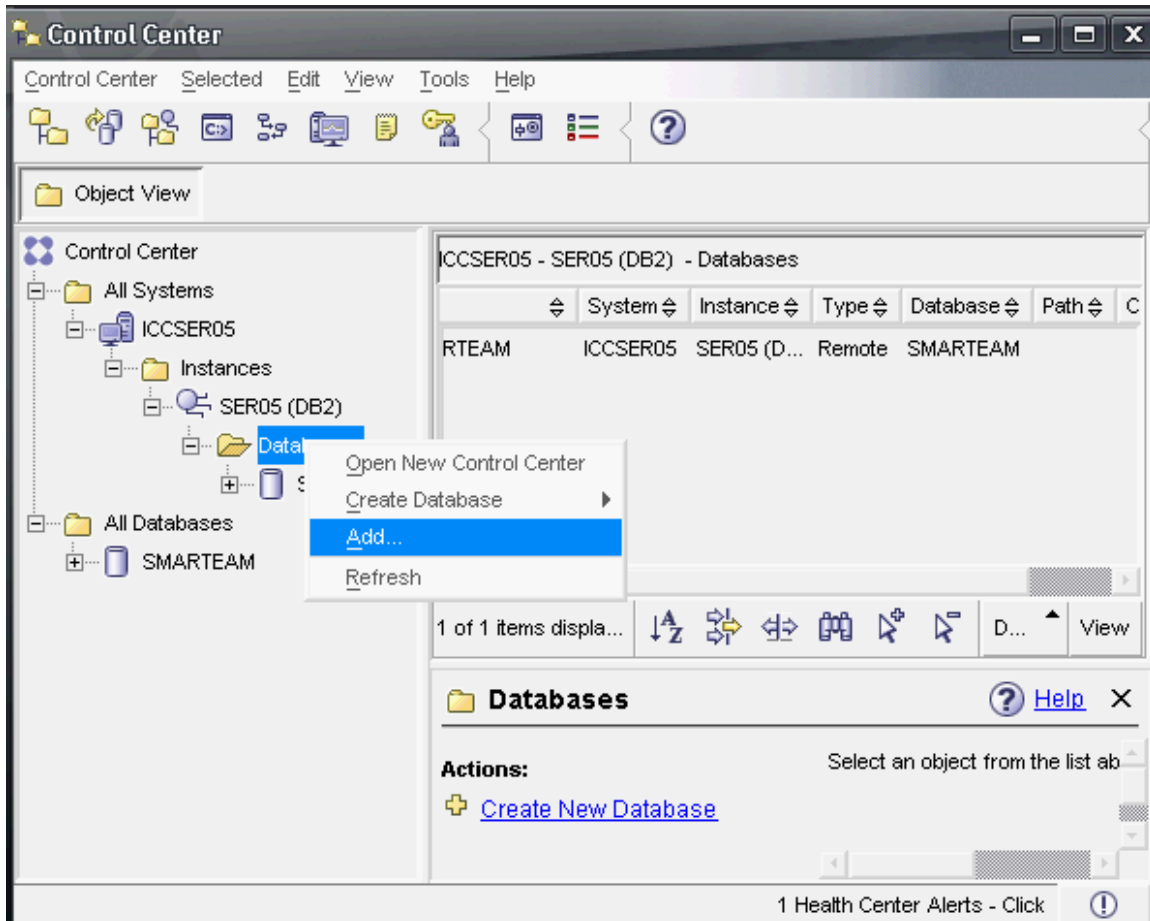
Reply NO

Now to back to the control center.

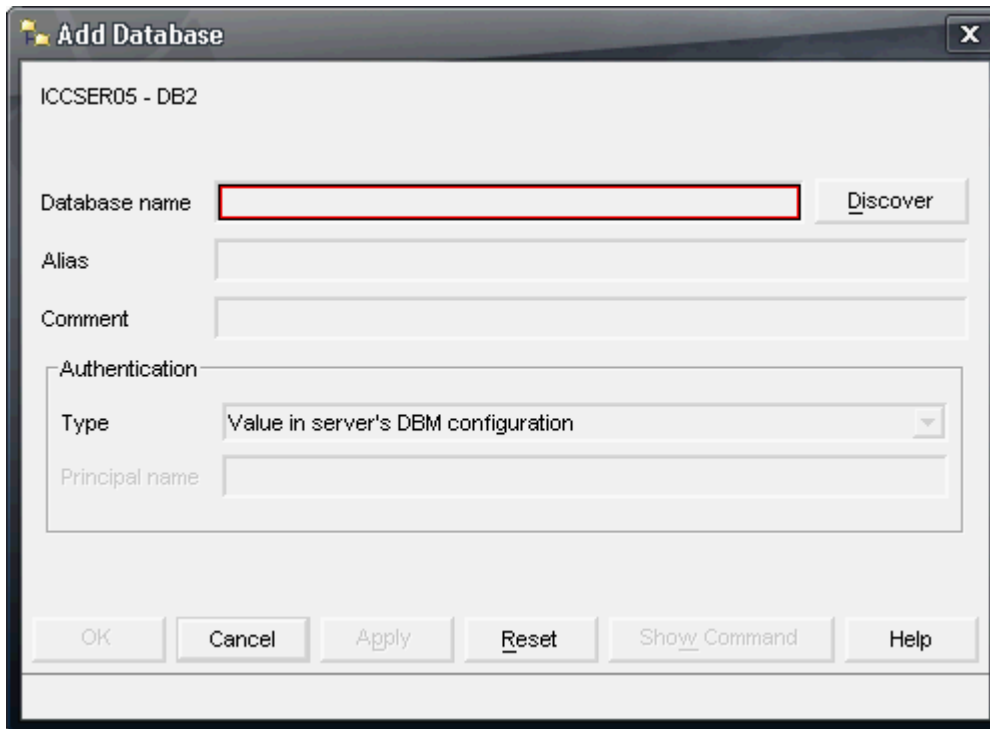
The control center is refreshed automatically if not do a refresh on the instance:



Adding an existing database to the control center



The following is **in case** if the data base is already created and is not visible ,to add more databases to the control center



**Add Database**

ICCSER05 - DB2

Database name  Discover

Alias

Comment

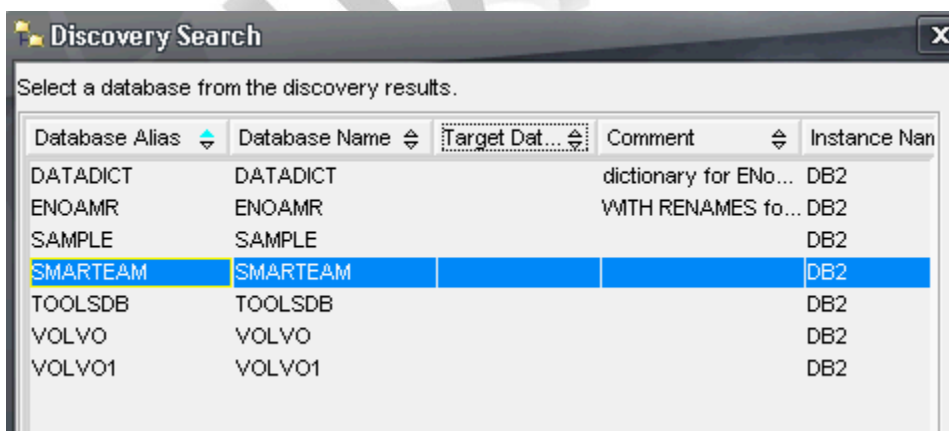
Authentication

Type Value in server's DBM configuration

Principal name

OK Cancel Apply Reset Show Command Help

Press the **discover** button to refresh the available databases



**Discovery Search**

Select a database from the discovery results.

Database Alias	Database Name	Target Dat...	Comment	Instance Nan
DATADICT	DATADICT		dictionary for ENo...	DB2
ENOAMR	ENOAMR		WITH RENAMES fo...	DB2
SAMPLE	SAMPLE			DB2
SMARTTEAM	SMARTTEAM			DB2
TOOLSDB	TOOLSDB			DB2
VOLVO	VOLVO			DB2
VOLVO1	VOLVO1			DB2

Select the desired data base you just created Press OK .

**NOTE :**

If you are in a local environment that is to say on the same server you might not need to make a refresh, however my recommendation is to always do a refresh





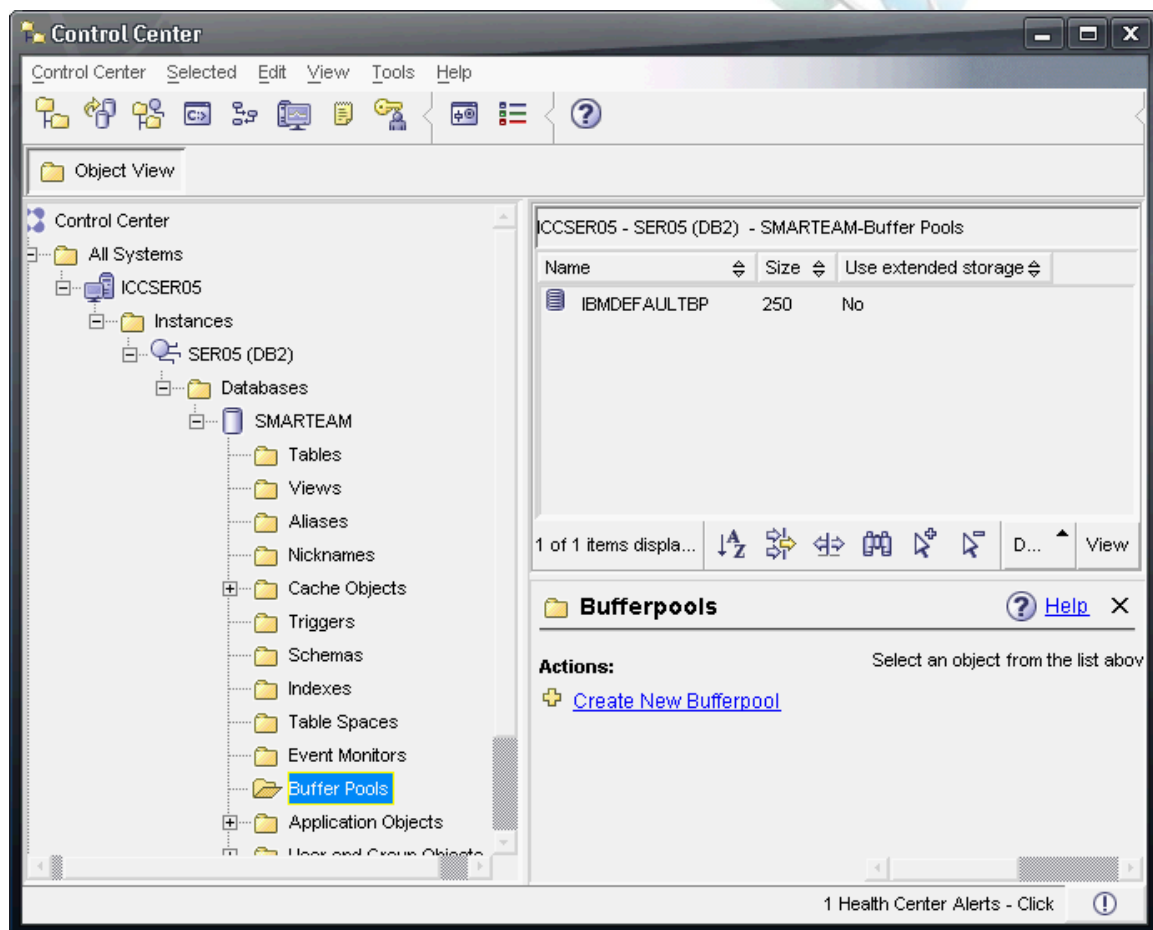
## Altering the data base to accept 8K pages

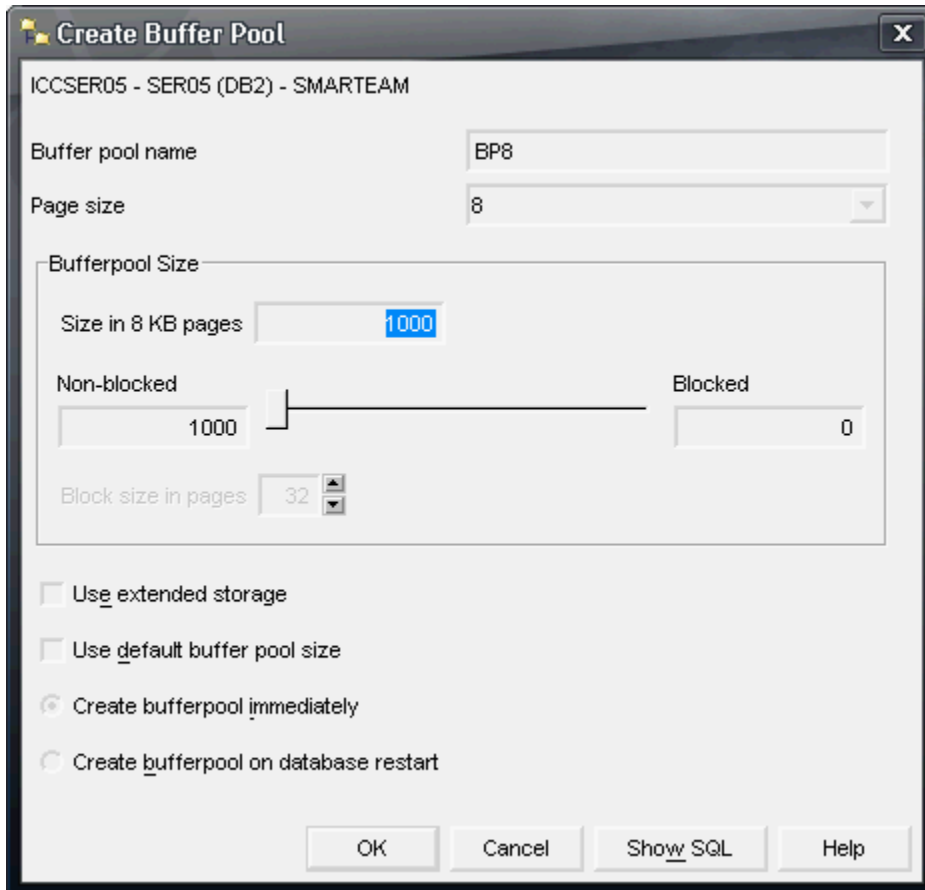
Now it is time to tailor the data base just created for SmarTeam application .

If your database does not show in the control center , You should press refresh . Please note that SmarTeam application requires in certain cases 8K pages depending on the features installed and the customization done which yields to a row length greater than 8K. The DB2default page size is 4K pages

In order to do that we create a new buffer pool where the page size is 8K .

select buffer pool , right click and select create





**Create Buffer Pool**

ICCSER05 - SER05 (DB2) - SMARTEAM

Buffer pool name: BP8

Page size: 8

Bufferpool Size

Size in 8 KB pages: 1000

Non-blocked: 1000 | Blocked: 0

Block size in pages: 32

☐ Use extended storage

☐ Use default buffer pool size

☒ Create bufferpool immediately

☐ Create bufferpool on database restart

OK Cancel Show SQL Help

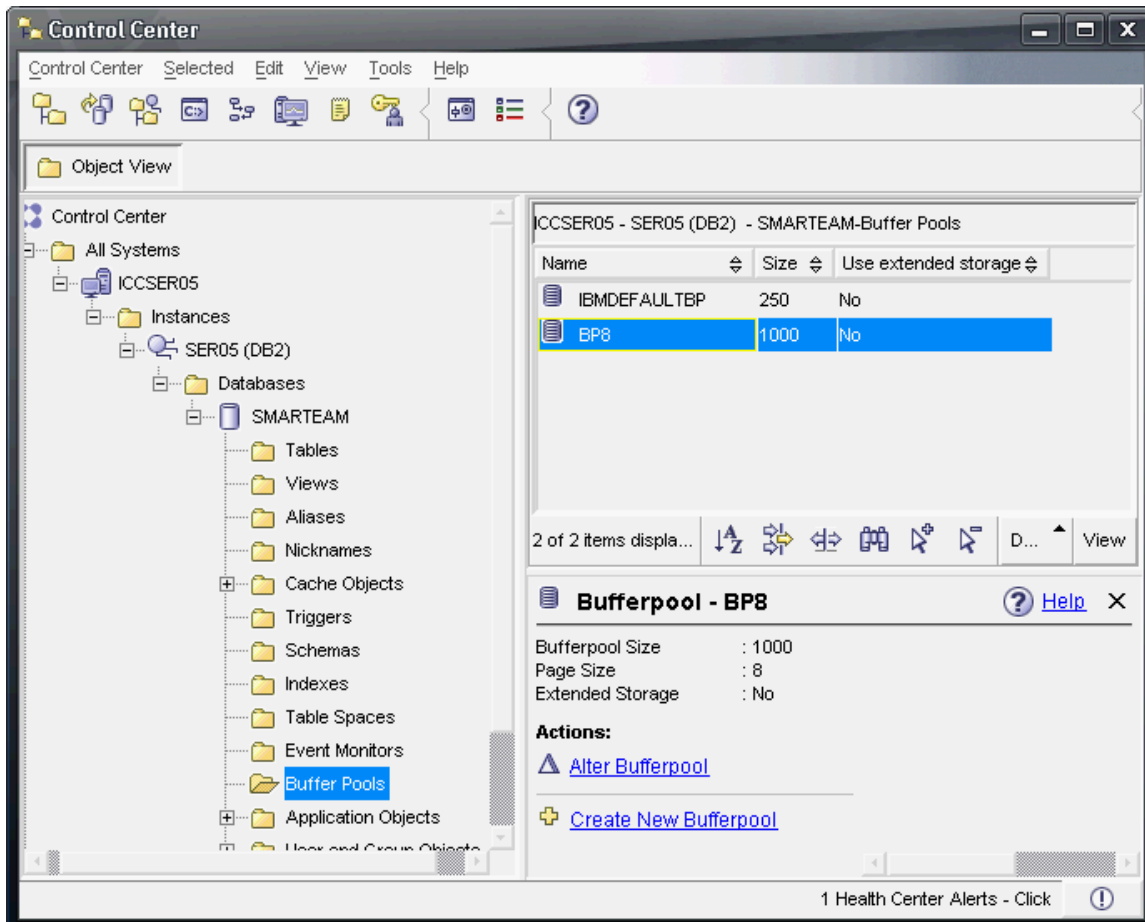
In order to activate this change

If we have created the DB with database restart option we have to stop and restart DB2 , otherwise the change is on the fly .

To restart DB2: Select the instance in question , right click and select shutdown . You will be presented with a confirmation dialogue where you should **check disconnect all applications** and press OK.

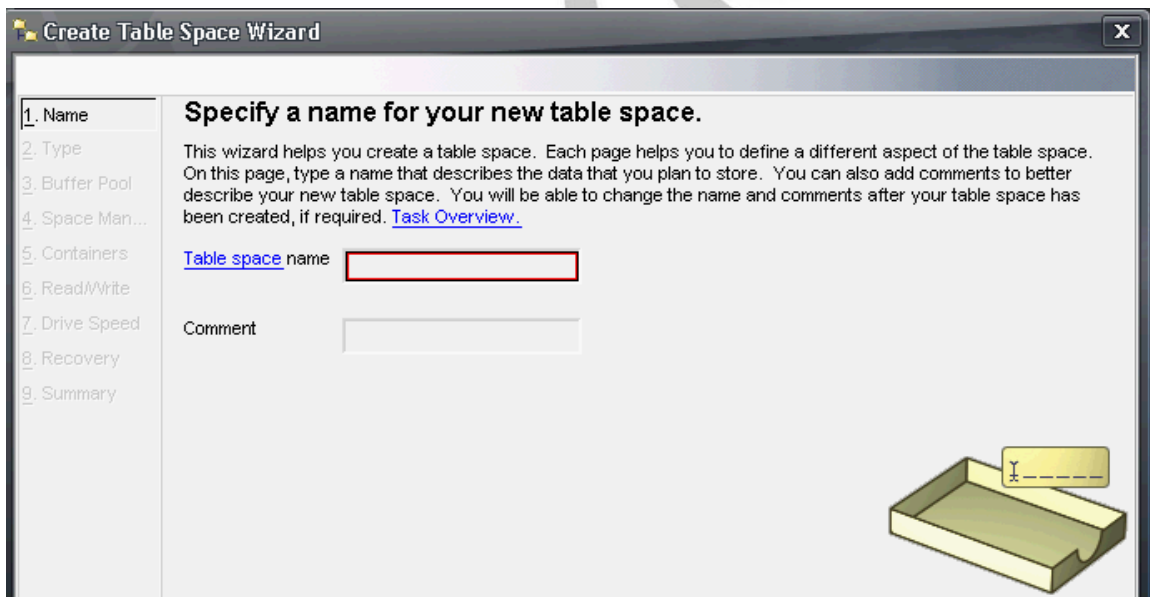
You will receive a confirmation that the shutdown is complete .

Select the instance in question, right click and select start to restart the instance. You will receive a confirmation that the restart is complete.



Now in the following step we will create new table spaces and associate them with the buffer pools. BP8 just created

Select table spaces, right click and select create. You will be presented with a wizard.



**Create Table Space Wizard**

**1. Name**

**Specify a name for your new table space.**

This wizard helps you create a table space. Each page helps you to define a different aspect of the table space. On this page, type a name that describes the data that you plan to store. You can also add comments to better describe your new table space. You will be able to change the name and comments after your table space has been created, if required. [Task Overview](#)

**Table space name**

**Comment**

[Task Overview](#)

[Task Overview](#)

We have chosen the following names TS\_SYSTEM01, TEMP01.DBF , USERS8K\_01 and USER01.DBF .. NOTE THAT YOU CANNOT USE ANY TABLE SPACE NAME STARTING WITH SYS.  
In the table space name type USER8K\_801



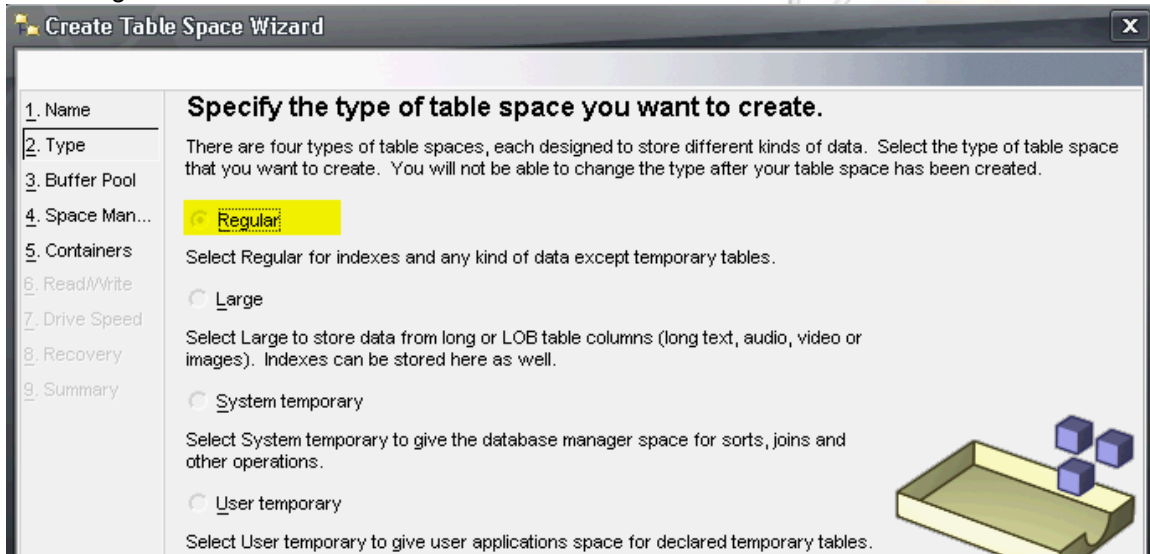
**Create Table Space Wizard**

1. Name **Specify a name for your new table space.**

This wizard helps you create a table space. Each page helps you to define a different aspect of the table space. On this page, type a name that describes the data that you plan to store. You can also add comments to better describe your new table space. You will be able to change the name and comments after your table space has been created, if required. [Task Overview.](#)

Table space name

Select regular



**Create Table Space Wizard**

2. Type **Specify the type of table space you want to create.**

There are four types of table spaces, each designed to store different kinds of data. Select the type of table space that you want to create. You will not be able to change the type after your table space has been created.

☒ **Regular**  
Select Regular for indexes and any kind of data except temporary tables.

☐ Large  
Select Large to store data from long or LOB table columns (long text, audio, video or images). Indexes can be stored here as well.

☐ System temporary  
Select System temporary to give the database manager space for sorts, joins and other operations.

☐ User temporary  
Select User temporary to give user applications space for declared temporary tables.

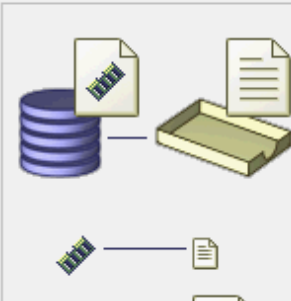
Select a buffer pool select the BP8 the bufferpool containing the 8K pages

## Specify a buffer pool for your new table space.

Specify a buffer pool, which is an area of memory used as a cache. Memory in the buffer pool is read and written in blocks. The [page size](#) determines how large these blocks of memory are. Select a buffer pool from the table below or click Create to create a new buffer pool. The table space page size must match the buffer pool page size, so the page size for the buffer pool you select will be used for your table space page size. For table spaces of type large, you must select a buffer pool that has a page size of 4KB. You will be able to change the buffer pool later, but you will not be able to change the page size after your table space has been created.

Buffer Pool	Number of Pages	Page Size (KB)
IBMDEFAULTBP	250	4
BP8	1000	8

Create



## Select Database managed

Create Table Space Wizard

1. Name
2. Type
3. Buffer Pool
4. Space Man...
5. Containers
6. Read/Write
7. Drive Speed
8. Recovery
9. Summary

### Select the space management system that you want to use.

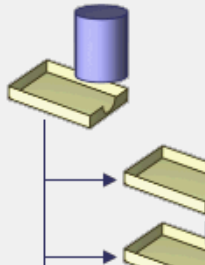
The space management system controls how and where your table space is stored. The type of space management that you select depends on how much control or performance you require. A system-managed space is easier to maintain and a database-managed space performs better. For table spaces of type large, a database-managed space management system must be used. You will not be able to change the space management system after your table space has been created.

☐ System-managed space (low maintenance)

A system-managed space (SMS) is controlled by the operating system. An SMS table space is the easiest for you to create and manage because it grows and shrinks automatically. You can view the database files and their sizes as the SMS table space grows and shrinks. You have less control over SMS table spaces.

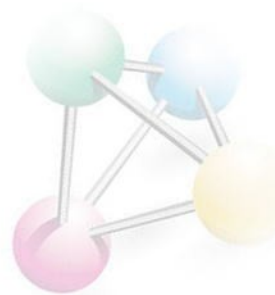
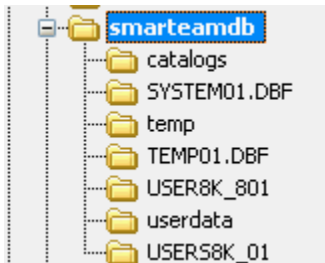
☒ Database-managed space (high performance)

A database-managed space (DMS) is one that lets you create separate table spaces for regular data, large data and indexes. This enables you to backup, restore and tune performance for each table space. With DMS, you must predefine the size and add containers as you want them to grow. You have more control over DMS table spaces.

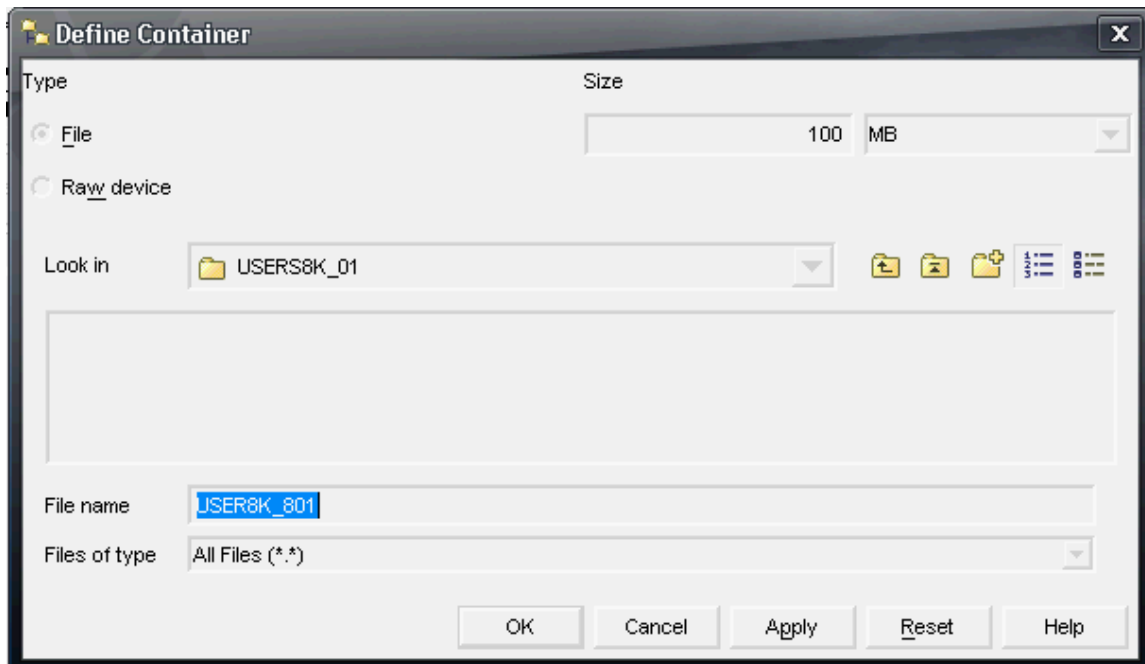


and press next to add containers

NB Here are the directories we have created



Select 100 MB , file , type the container name and the directory name ( which already exists )



Press OK .



### Define containers for this table space.

A container defines where you want your data stored. Click Add to add a DMS container to your new table space. You can improve the performance of your database by defining multiple containers on separate physical drives. This enables [parallel prefetching](#). You will only be able to change the size of your container definitions after your table space has been created, if required.

Container name	Type	Size	
C:\smarteandb\USERS8K_01\USER8K_801	File	100.00	<input type="button" value="Add..."/> <input type="button" value="Change..."/> <input type="button" value="Remove"/>

1 of 1 items displayed

Total allocated 100 MB

Click Finish .

The same for SYSTEM 8K and here is the summary

### Review the actions that will take place when you click Finish.

When you click Finish, the wizard creates a table space. To change any of the parameters, go back to the appropriate page. To view the equivalent SQL command, click Show SQL.

Table space name	TS_SYSTEM
Table space type	Regular
Buffer pool	BP8
Page size	8
Managed by	Database
Extent size	16
Prefetch size	16
Overhead	10.5
Transfer rate	0.14
Dropped table recovery	Off
Total space allocated	20 MB
Number of containers defined	1

Show SQL

CONNECT TO SMARTEAM;  
CREATE REGULAR TABLESPACE TS\_SYSTEM PAGESIZE 8 K MANAGED BY DATABASE USING  
( FILE 'C:\smarteamdb\SYSTEM01.DBF\TS\_SYSTEM' 2560 ) EXTENTSIZE 16 OVERHEAD 10.5  
PREFETCHSIZE 16 TRANSFERRATE 0.14 BUFFERPOOL BP8 DROPPED TABLE RECOVERY OFF;  
CONNECT RESET;

CloseSave...Help

Show SQL

Next is the temp Please note that it is recommended to let the system deal with the temporary space hence we will select managed by system

### Review the actions that will take place when you click Finish.

When you click Finish, the wizard creates a table space. To change any of the parameters, go back to the appropriate page in this wizard. To view the equivalent SQL command, click Show SQL.

Table space name	TEMP01
Table space type	System temporary
Buffer pool	BP8
Page size	8
Managed by	System
Extent size	16
Prefetch size	16
Overhead	10.5
Transfer rate	0.14
Number of containers defined	1

Show SQL

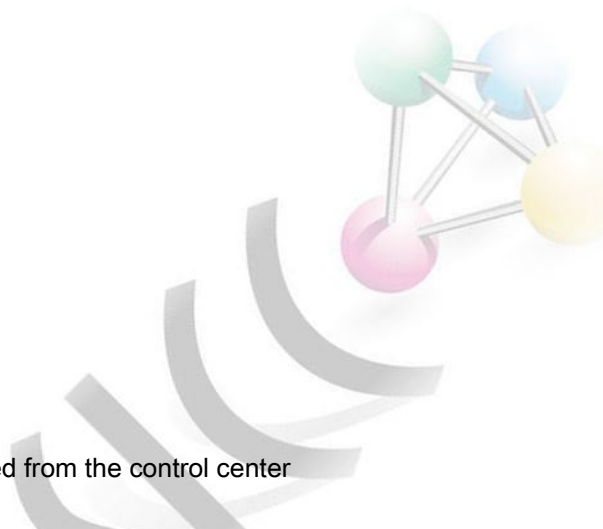
CONNECT TO SMARTEAM;  
CREATE SYSTEM TEMPORARY TABLESPACE TEMP01 PAGESIZE 8 K MANAGED BY SYSTEM  
USING ('C:\smarteandb\TEMP01.DBF') EXTENTSIZE 16 OVERHEAD 10.5 PREFETCHSIZE 16  
TRANSFERRATE 0.14 BUFFERPOOL BP8;  
CONNECT RESET;

Close

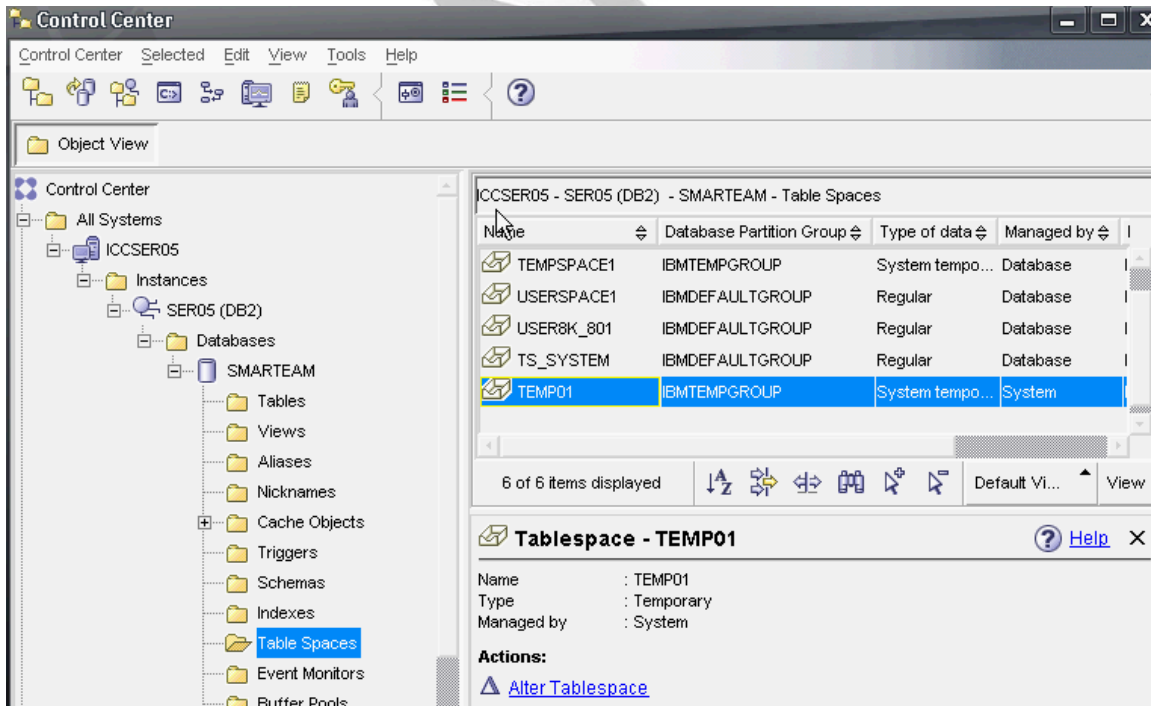
Save...

Help

It is always a good practice to stop and start the instance for the changes to take effect .



Here is the final result as observed from the control center



The screenshot shows the IBM Control Center interface. On the left, the 'Object View' tree displays the hierarchy: Control Center > All Systems > ICCSER05 > Instances > SER05 (DB2) > Databases > SMARTTEAM. The 'Table Spaces' folder is selected. The main pane shows a table of table spaces for 'ICCSER05 - SER05 (DB2) - SMARTTEAM'.

Name	Database Partition Group	Type of data	Managed by
TEMPSPACE1	IBMTMPGROUP	System tempo...	Database
USERSPACE1	IBMDEFAULTGROUP	Regular	Database
USER8K_801	IBMDEFAULTGROUP	Regular	Database
TS_SYSTEM	IBMDEFAULTGROUP	Regular	Database
TEMP01	IBMTMPGROUP	System tempo...	System

Below the table, it says '6 of 6 items displayed'. A detailed view for 'Tablespace - TEMP01' is shown at the bottom, with the following properties:

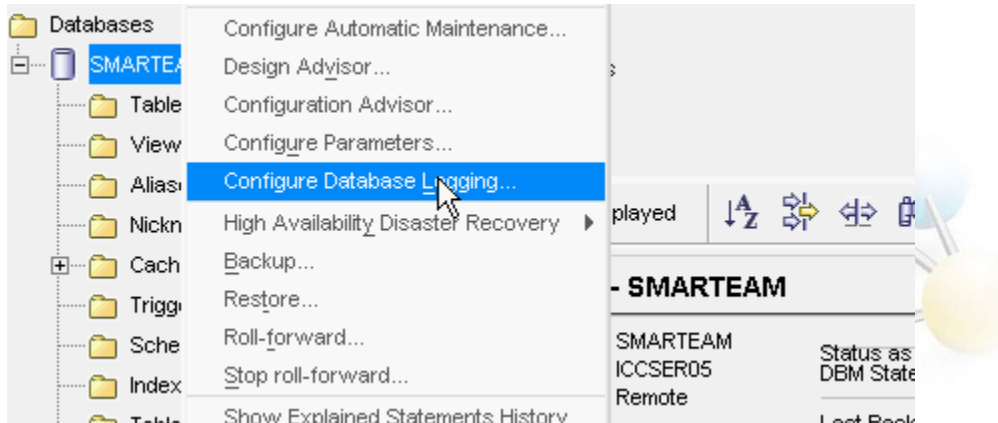
- Name: TEMP01
- Type: Temporary
- Managed by: System

Actions: [Alter Tablespace](#)



## Defining DB2 database logging

Clicking with the right mouse on the db you will be present with a contextual choice with the log configuration wizard



### Choose your logging type.

This wizard helps you configure database [logging](#) for the database named below. [backup](#) and [recovery](#) options available to you, as shown below. [Task Overview](#)

Click next to continue.

Database : ICCSER05 - SER05 (DB2) - SMARTEAM

Database State : INCONSISTENT

Current Logging Type : CIRCULAR

☒ Circular Logging

☐ Archive Logging




Online backups are possible: 

Table space backups are possible: 

Can recover to any point in time: 

Automatic log file management: 

Do not panic if you see that the current state is inconsistent , this means simply at that exact time there are certain transactions being executed . You do not need to have a consistent state to complete our exercise . A stop and restart db2 will put the state to consistent .

### Logging Type

Use this page to select whether you want to use circular logging or archive logging. The wizard provides information on what operations you can perform depending on the type of logging. For simple administration we will be using the circular logging .

### Log Archiving

Specify whether you want to archive the log files manually or if you want the database manager to call a user exit program for archiving logs.

### Logging Size

On this page, the wizard recommends values for the number of primary and secondary log files you should use, and the size of the log files. You can modify these values. You can also indicate whether you want to use infinite logging

These values depend on the data volume and the number of transactions

I have put a guideline which might not be true in case of your installation

### Choose the number and size of your log files.

Specify the number of database log files to allocate, and their sizes. Remember that primary log files are pre-allocated, while secondary log files are allocated as needed.

Increasing these values will increase the disk requirements for the logs. If you find that secondary log files are frequently being created, you may be able to improve system performance by increasing the log file size or by increasing the number of primary log files.

Total Disk Space needed for Log Directory: 20000 KB

Number of Primary Log Files

3

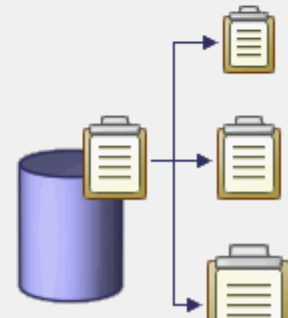
Number of Secondary Log Files

2

Defau

Size of Each Log File (4K Pages)

1000



### Logging Location

Use this page to specify the location of the directory where you want to store your log files. You can also indicate whether you want to mirror your log files and specify a location where you want additional copies of your log files to be stored.



### Specify the location of your log files.

Specify the path where you want your log files stored. Your current location is shown. You can also select to have your logs [mirrored](#). A backup copy of your log files will be kept at a different location. Mirroring is helpful in high availability environments.

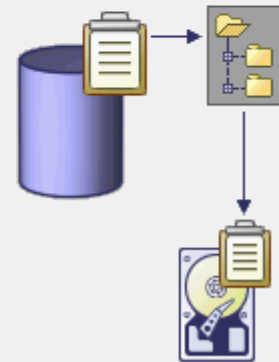
For increased efficiency, place log files on a physical disk that does not have high I/O. Also, place your mirrored log files on a different disk than your primary database log files. In a partitioned database environment, the partition number is automatically appended to the path.

Active Log Path

Mirror Log Files

☐ Mirror Logs - Keep a backup copy of your database log files at a different location.

Mirror Log Path



### Backup Image

Use this page to specify the media type on which you want to store backup images, and provide details about the media type. This page ***appears if you have specified archived logging***.

### Partitions

This page is available only if you are configuring logging options for a database on a partitioned database system. Use this page to organize partitions into groups. Logging options for groups will be configured serially. Logging options for partitions within groups will be configured in parallel. ***Data Base partition feature is available only in Enterprise Server Edition as a chargeable feature.***

### Backup Options

On this page, the wizard provides recommended values for parallelism (number of buffer manipulators), the number of buffers, and the size of buffers you should use. You can

modify these values. You can also use this page to specify if you want to quiesce the database before you perform a database backup. This page *appears if you have specified archived logging*.

### Schedule

Use this page to schedule when the logging options should be configured.

The scheduling of any task using the db2 supplied tools require a database where DB2 can put all the information needed. The data base can be remote or local. And will be created on the fly if it does not exist

#### Enabling the DB2 scheduling function...

To enable the scheduling function of DB2, you need to create a database to store task and schedule information. Creating this database also enable other [Task Center](#) features. The Task Center provides support for more complex [task](#) scheduling and management.

- ☒ Run now without saving task history
- ☐ Enable Scheduler

##### Enabling Scheduling Function

DB2 is unable to find a [Tools Catalog](#) for any of your catalog systems. To activate the DB2 scheduling function, it is necessary to create a Tools Catalog on at least one of the cataloged systems. Select a system and click Create New.

▼

### Summary

This page allows you to review the decisions that you made for your configuring your database logging options, and to view the command that will modify the database logging options.

#### Review the actions that will take place when you click Finish.

When you click Finish, the wizard creates the jobs necessary to change your database logging configuration. To change any of the parameters, go back to the appropriate page in this wizard. To view the equivalent commands, click the Show Command button.

Database : ICCSER05 - SER05 (DB2) - SMARTEAM

Current Logging Type : CIRCULAR

New Logging Type : CIRCULAR

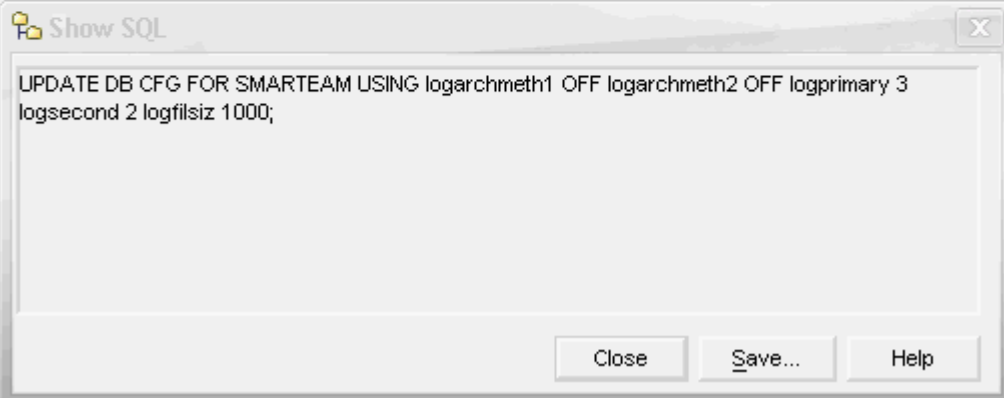
Number of Primary Log Files : 3

Number of Secondary Log Files : 2

Size of Each Log File (4K pages) : 1000

Active Log Path : E:\DB2\NODE0000\SQL00005\SQLLOGDIR\

Mirror Logs : NO



## Defining SmarTeam user in the system and DB2

DB2 relies on current installed system security facilities standard OS security , LDAP,NIS etc ....  
This means that DB2 authenticate the user via these mechanisms before giving the access to the database .

We need to define all database users .

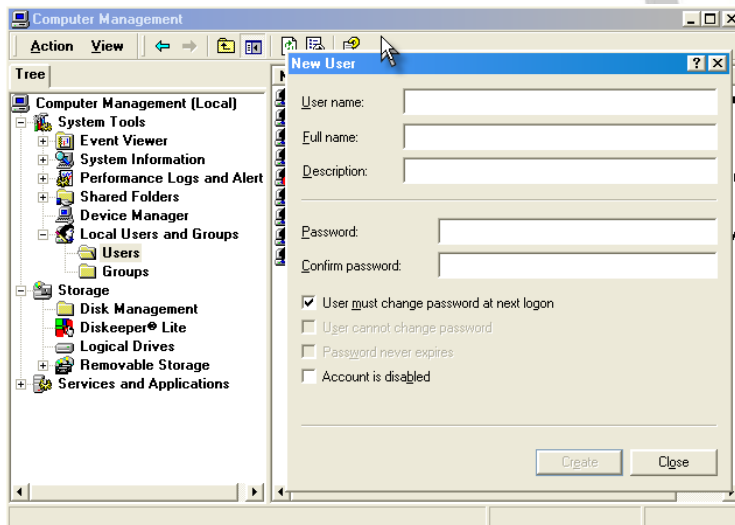
This can be accomplished in 2 stages :

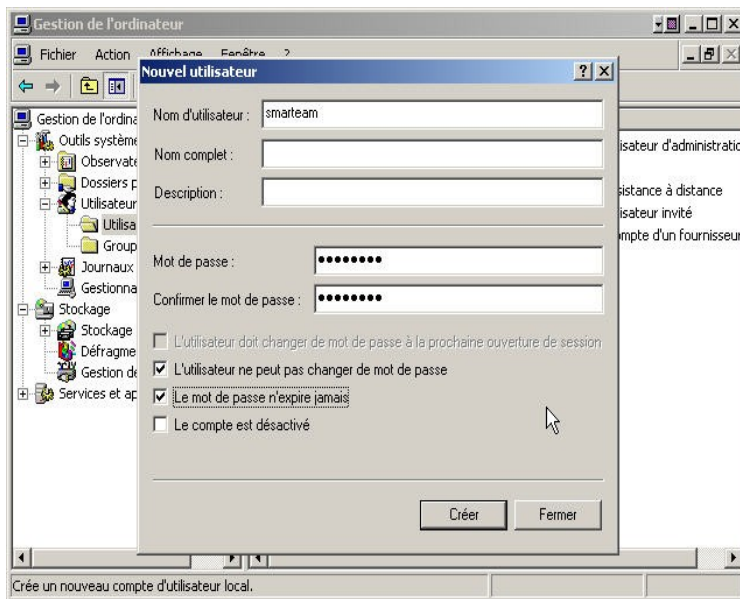
First we have to add SmarTeam user to the windows security :

Settings →control panel→administration tools→computer management→local users→users

Make sure to select user cannot change the password & password cannot change

Define as well the password all of the above based your company security regulations



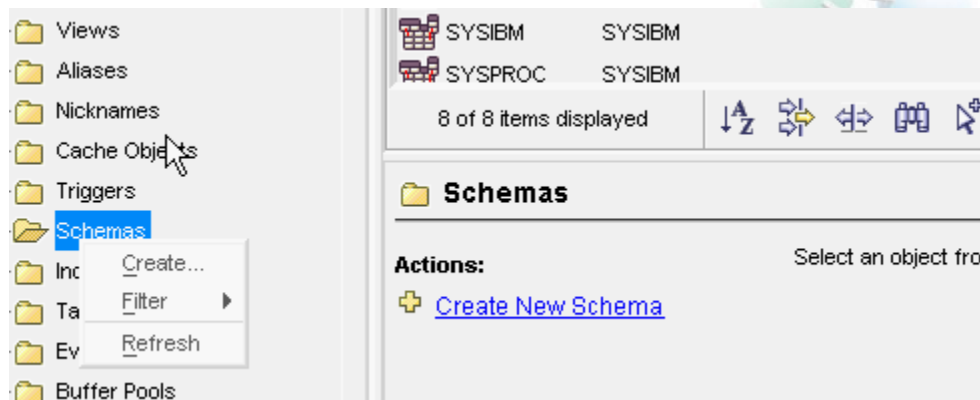


Use the same mechanisms available on UNIX such as smit in AIX to add users and groups

## Creating SmarTeam schema

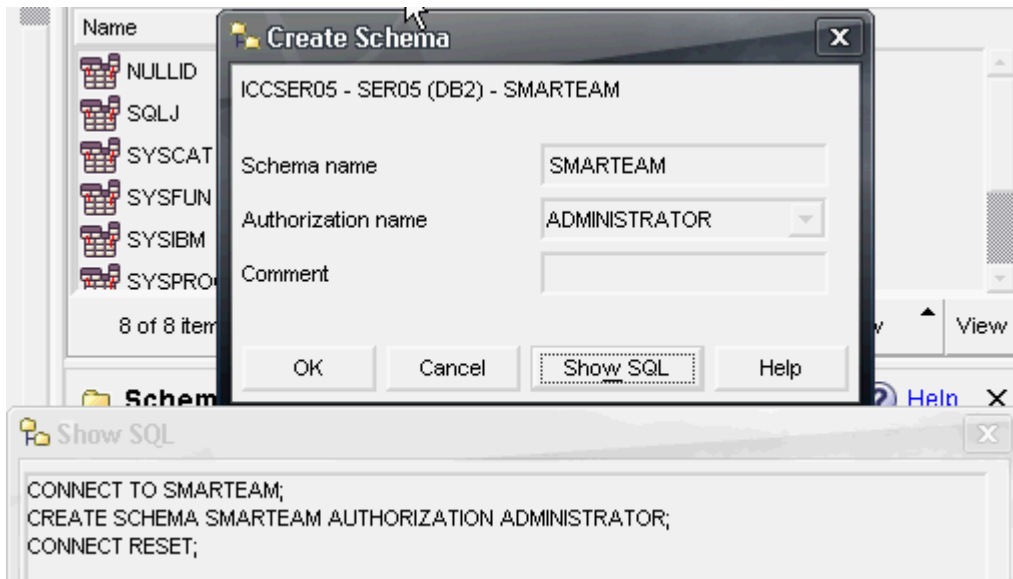
Now it is the time to create SmarTeam Schema.

From the control center . You might be asked to login the database ( if you are in a client environment )



Select **Schemas** → right click → select **create** and enter SmarTeam as the schema name and for the authorization name select the user you have signed on with as well .

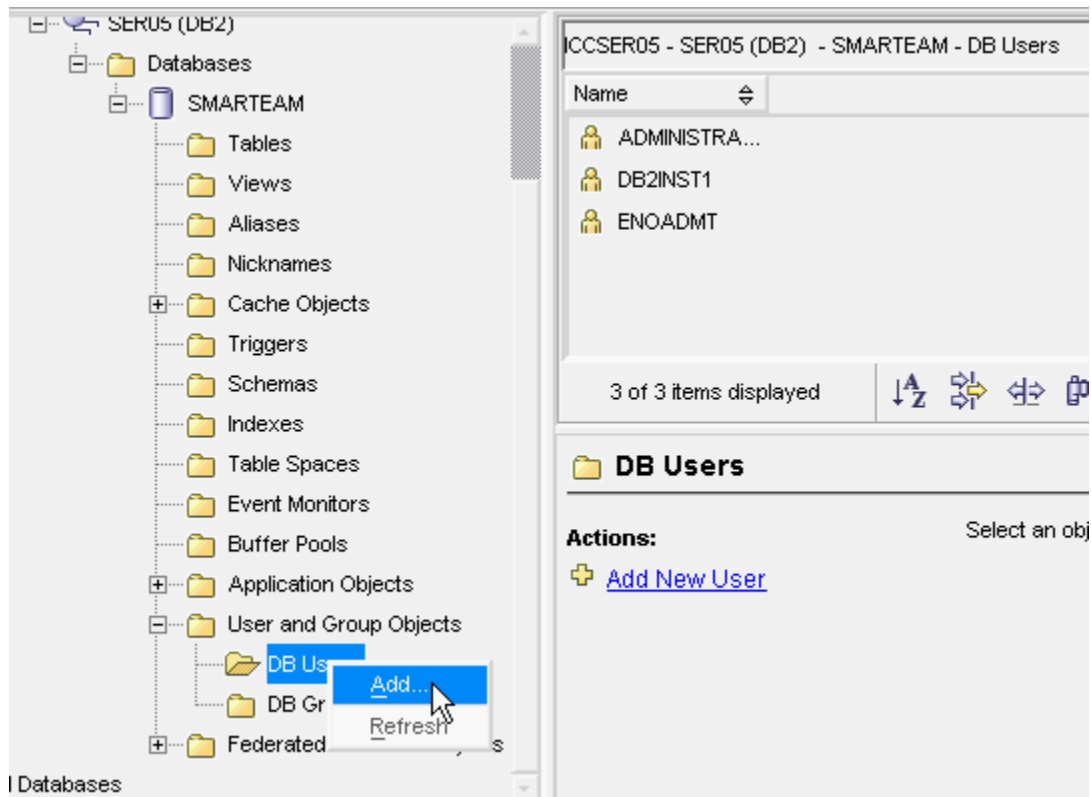
→ press OK



Now we are ready to give the user SmartTeam all his rights and privileges for the database.

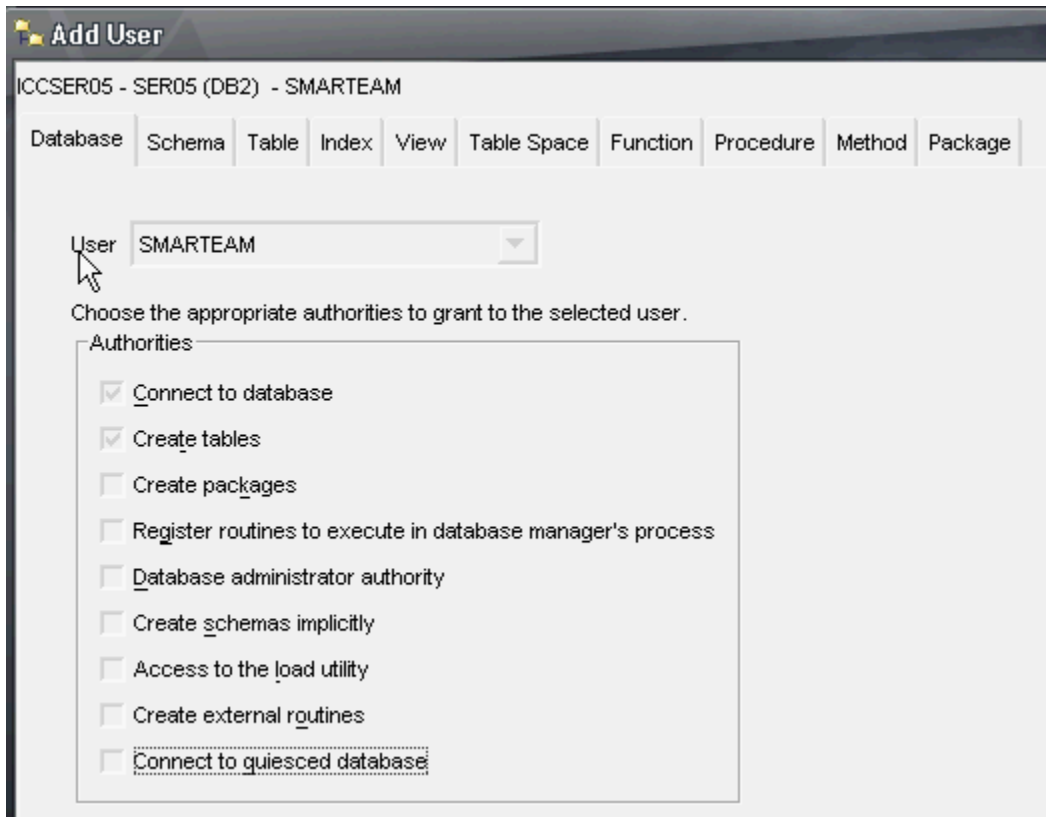
From the control center we select from the Users & groups folder the DB users , right click and select add .

You will be presented with a screen similar to this one



On add user click on the user arrow to expand the list and select the SmartTeam user , if the user you want to give authorization does not exist , this means that you have to define him as a user associated with a group belonging to DB2.





**Add User**

ICCSER05 - SER05 (DB2) - SMARTTEAM

Database Schema Table Index View Table Space Function Procedure Method Package

User: SMARTTEAM

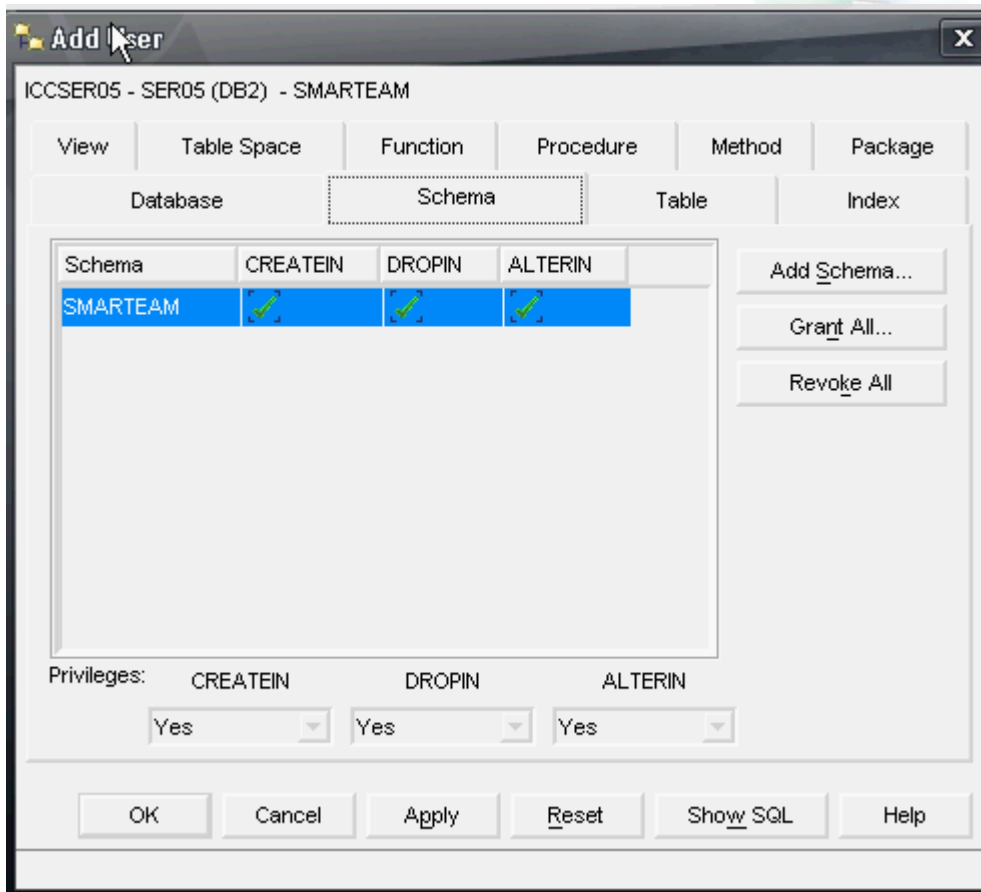
Choose the appropriate authorities to grant to the selected user.

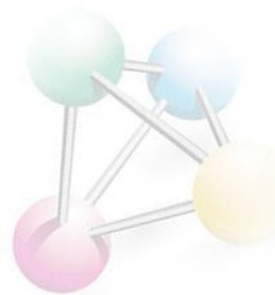
Authorities

- ☒ Connect to database
- ☒ Create tables
- ☐ Create packages
- ☐ Register routines to execute in database manager's process
- ☐ Database administrator authority
- ☐ Create schemas implicitly
- ☐ Access to the load utility
- ☐ Create external routines
- ☐ Connect to quiesced database

Only the first 2 entries are required

We have to add the schemas of users which will access the database to grant authorizations later





Now we start granting authorities , rights and privileges to SmarTeam db user on tables  
remember to press add table and select the tables you want . Multiple selections are allowed  
**Ctrl + left click .**  
**OR Click on Grant all**

**Change User - SMARTEAM**

ICC3609 - A309 (DB2) SA\_PERF - SMARTEAM

Database Schema **Table** Index View Table Space Function Procedure Method Package

Table	SELECT	INSERT	UPDATE	DELETE	CONTRO
SMARTEAM.AU...	✓	✓	✓	✓	✓
SMARTEAM.DA...	✓	✓	✓	✓	✓
SMARTEAM.FIL...	✓	✓	✓	✓	✓
SMARTEAM.NO...	✓	✓	✓	✓	✓
SMARTEAM.OB...	✓	✓	✓	✓	✓
SMARTEAM.PH...	✓	✓	✓	✓	✓
SMARTEAM.RO...	✓	✓	✓	✓	✓
SMARTEAM.ST...	✓	✓	✓	✓	✓
SMARTEAM.TD...	✓	✓	✓	✓	✓
SMARTEAM.TD...	✓	✓	✓	✓	✓
SMARTEAM.TD...	✓	✓	✓	✓	✓
SMARTEAM.TD...	✓	✓	✓	✓	✓
SMARTEAM.TD...	✓	✓	✓	✓	✓
SMARTEAM.TD...	✓	✓	✓	✓	✓

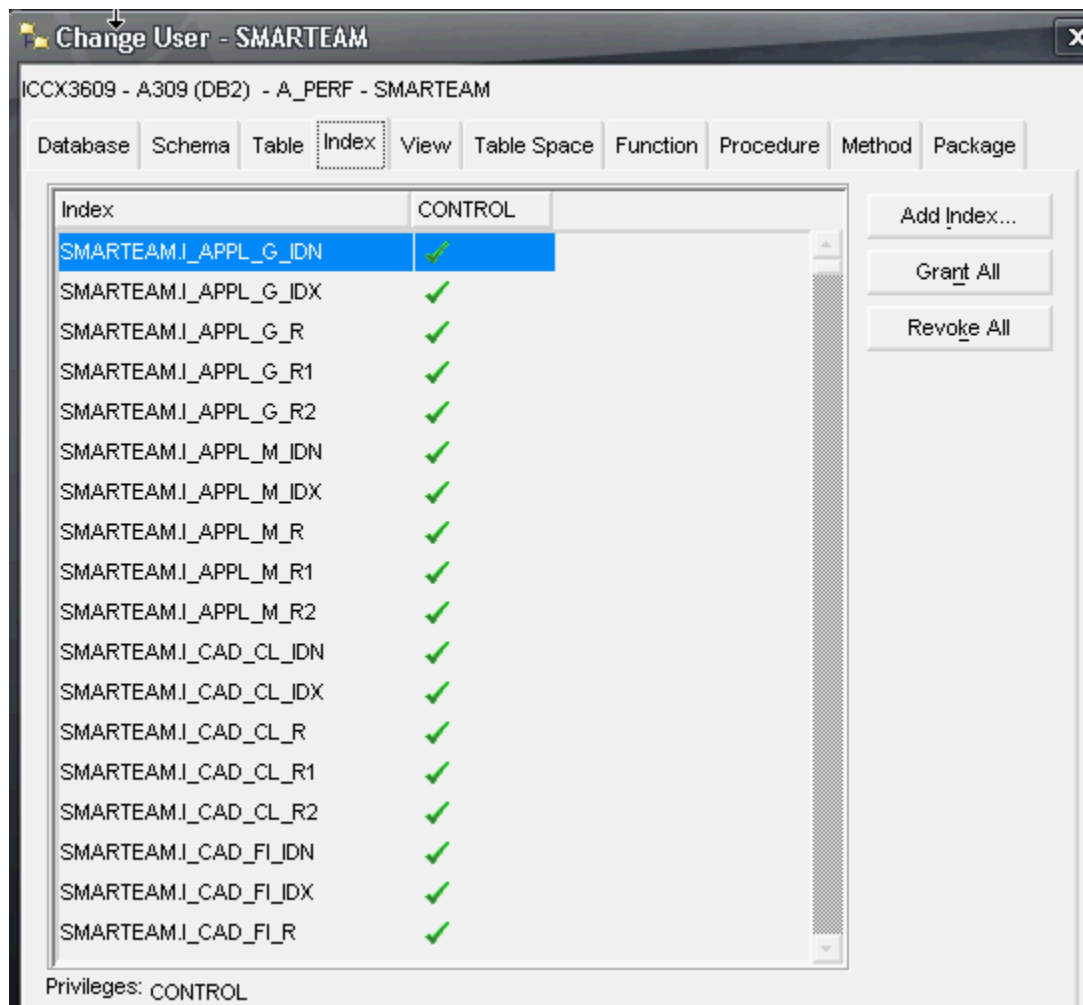
Add Table...  
Grant All  
Revoke All

Privileges:

SELECT	INSERT	UPDATE	DELETE
Grant	Grant	Grant	Grant
CONTROL	ALTER	INDEX	REFERENCES
Yes	Grant	Grant	Grant

OK Cancel Reset Show SQL Help

Now we start giving authorities , rights and privileges to SmarTeam db user on index



Now we start giving authorities , rights and privileges to SmarTeam db user on views  
At the beginning we get the following panel empty

Select all views available and grant all.



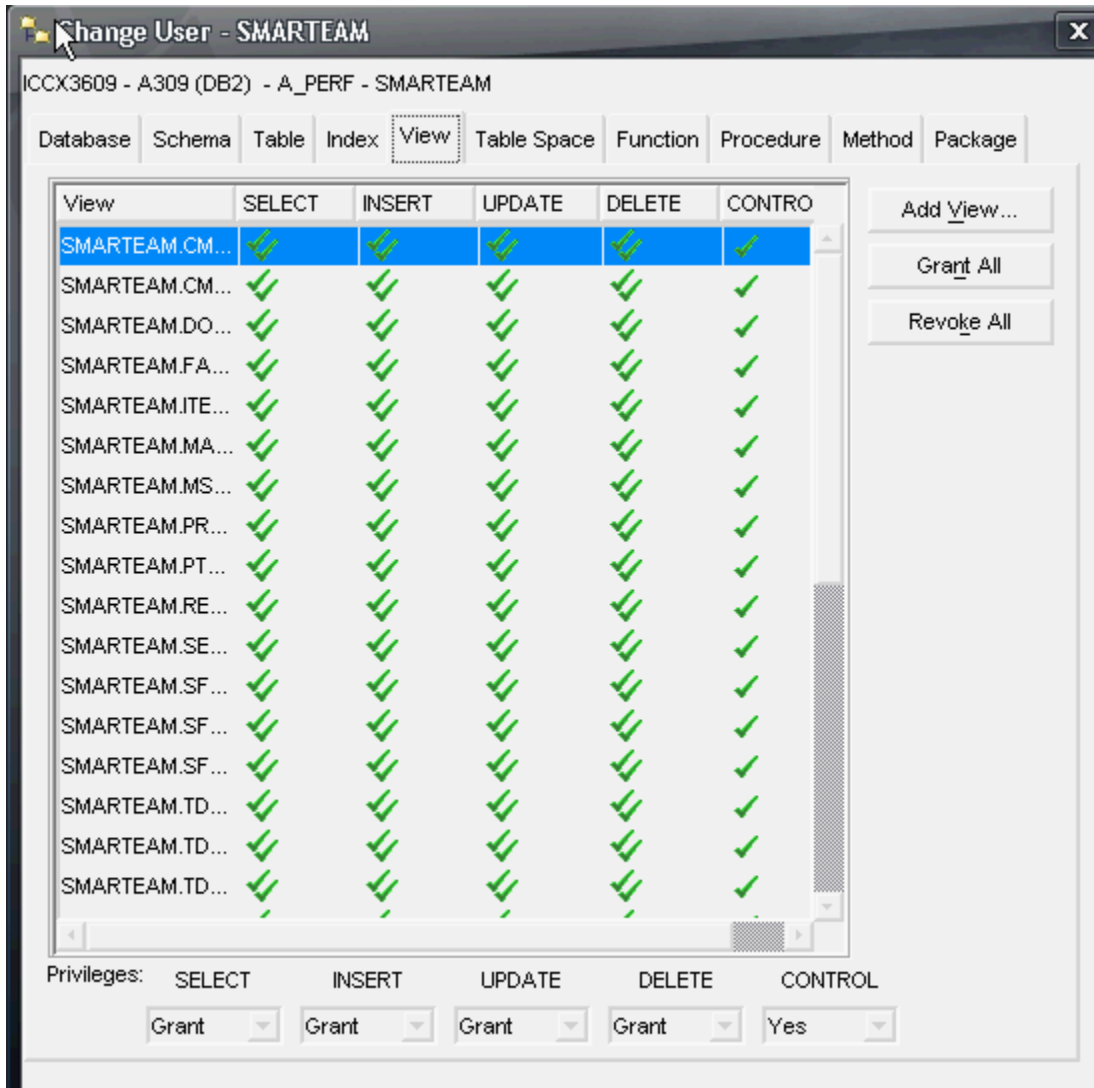
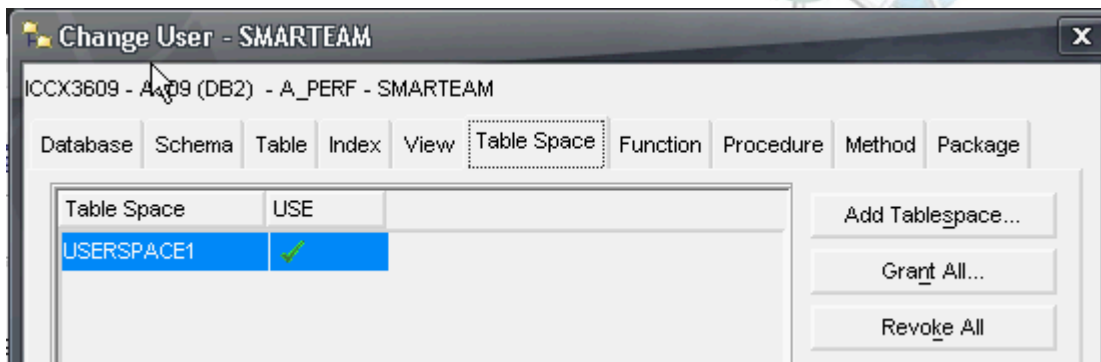


Table Space is currently empty add the other tablespaces .



At this stage you can start using the database with SmarTeam . However I recommend that you go through to the end of this paper and performing

- the DDL backup along
- changing the LOGPATHS if needed .



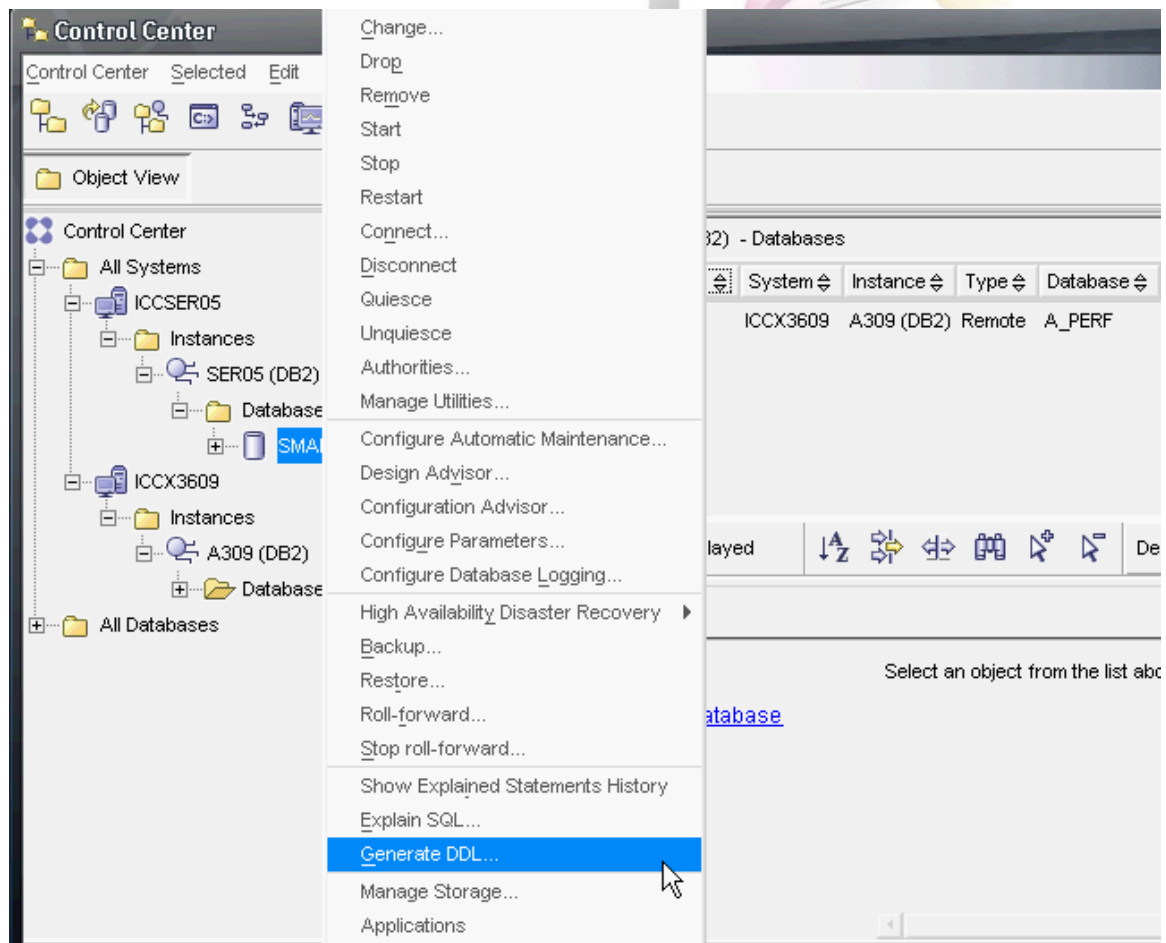
## Backing up the structure

or get the DDL that creates the database

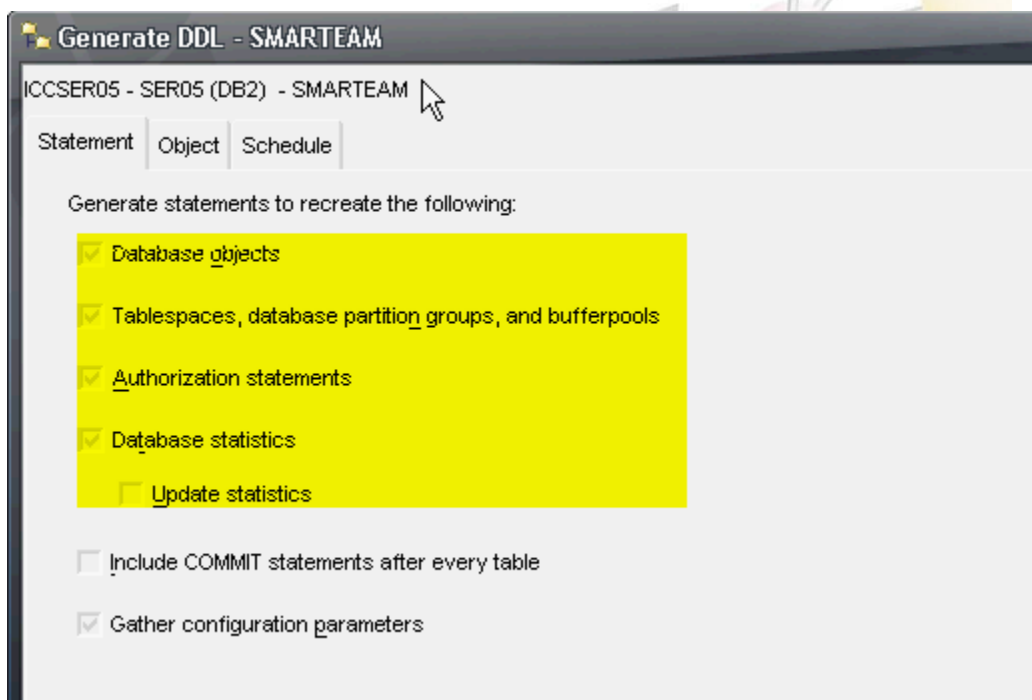
Now the final step of our exercise is to generate the DDL data definition language script that generates the database .

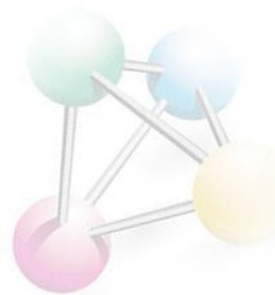
Stop and restart DB2 either from the command line using **db2stop force** then **db2start** or from the control center .

Now from the control center right click on the db and select **generate ddl** .

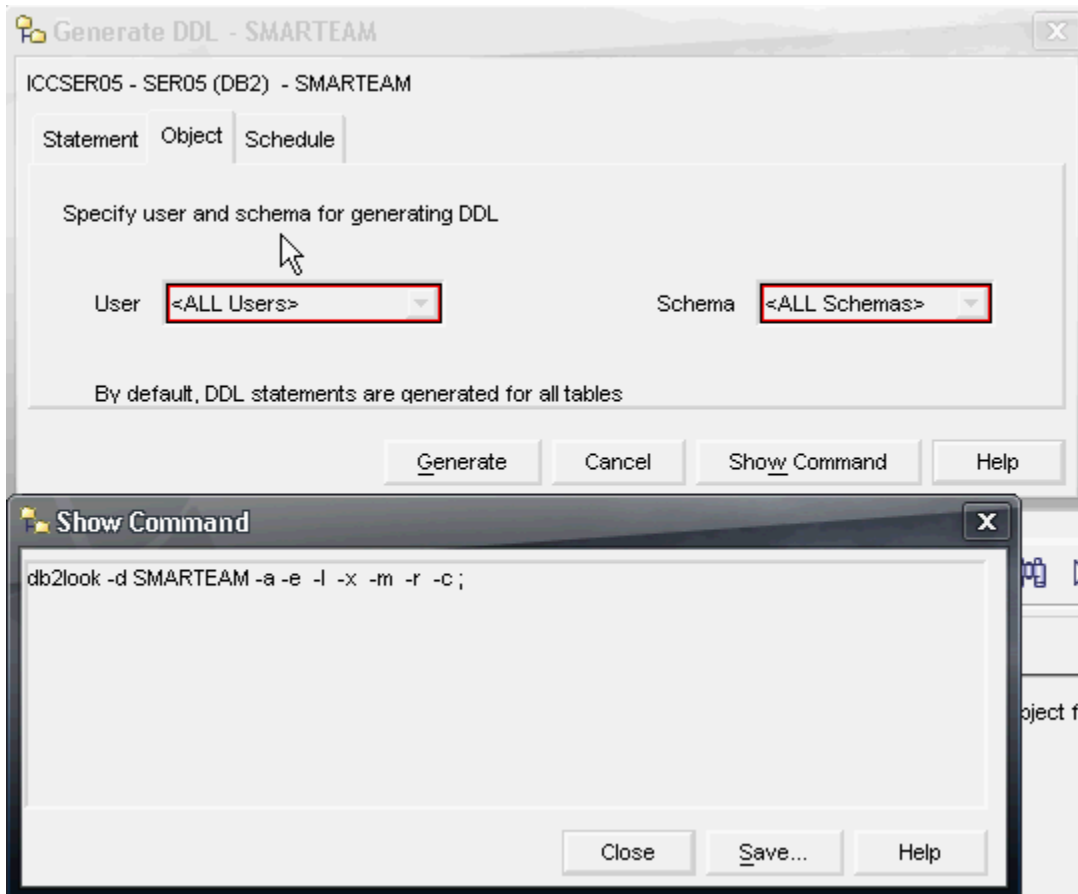


You will be introduced to the following wizard which deals with generating the ddls needed . By the way issuing the command **db2look** from a command line will do the same thing .

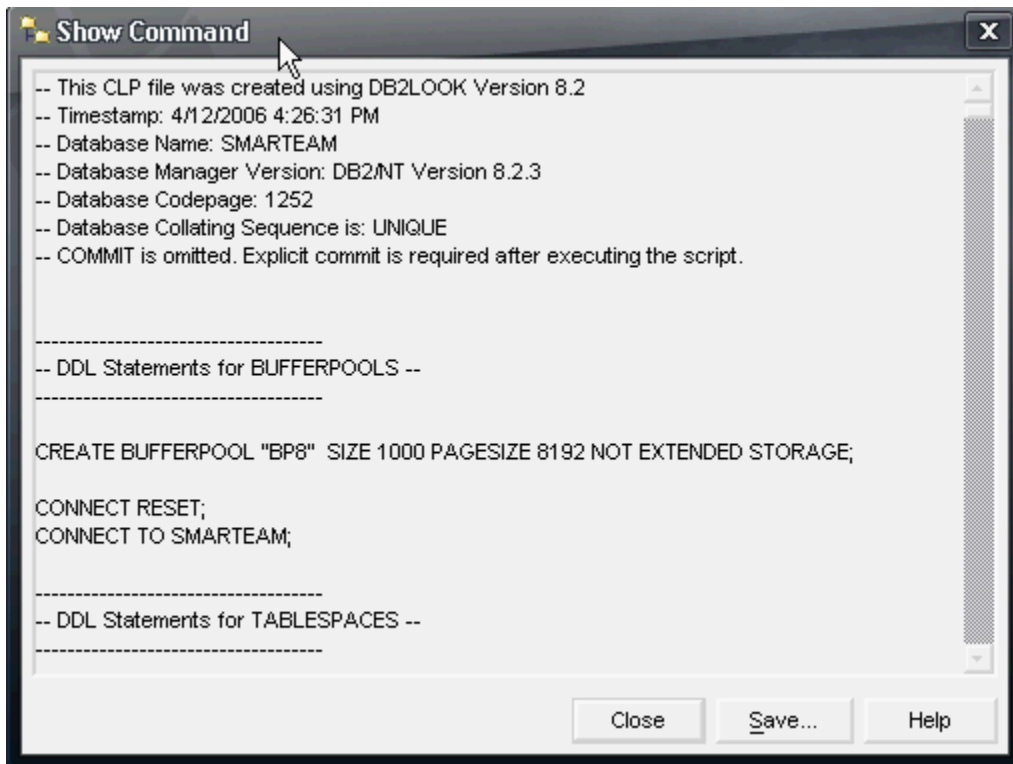




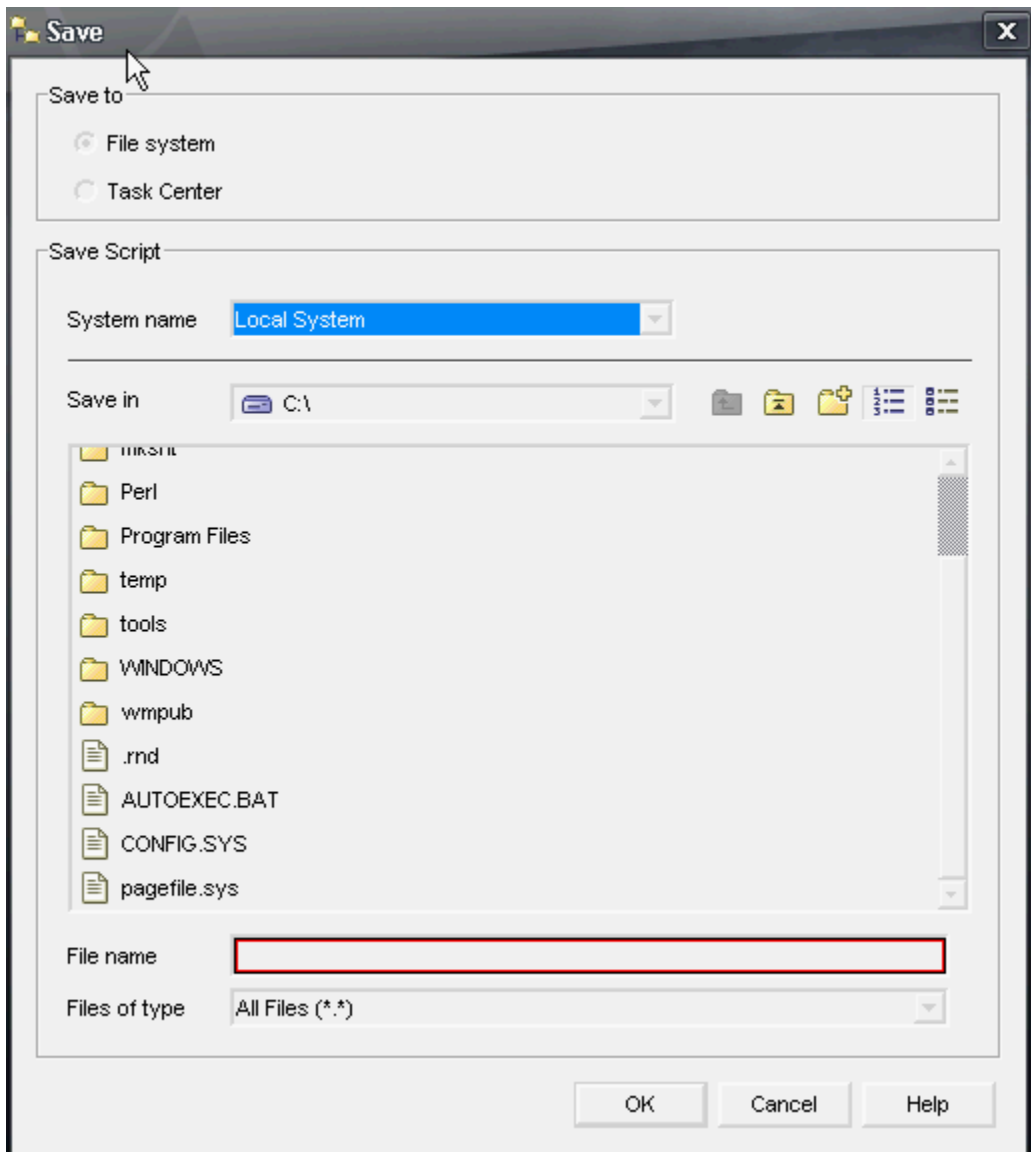
Select DB objects , Tablespaces & bufferpools , authorizations and statistics .  
Next step we select the next tab to deal with objects



We select all users and all schemas . then press generate to generate the actual DDLs .



Press the **save** button



You can save the generated DDLs either to the local system or to a remote file systems whether Unix or Windows bearing in mind to respect the naming conventions for files ex Unix systems do not like blanks in the filename nor special characters .

You can also save it also in the task center for later execution if needed.

## Recreate the structure

or execute the DDLs that creates the database in case of cloning the database on a different server architecture ( AIX & windows ) or as a backup or documentation etc ....

This is performed on 2 steps :

1) We create an empty data base .

From the control center

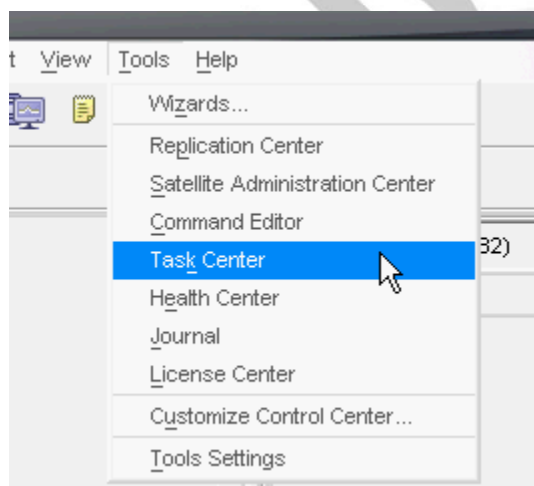
From the command line ( db2cmd in Windows ) using the following command

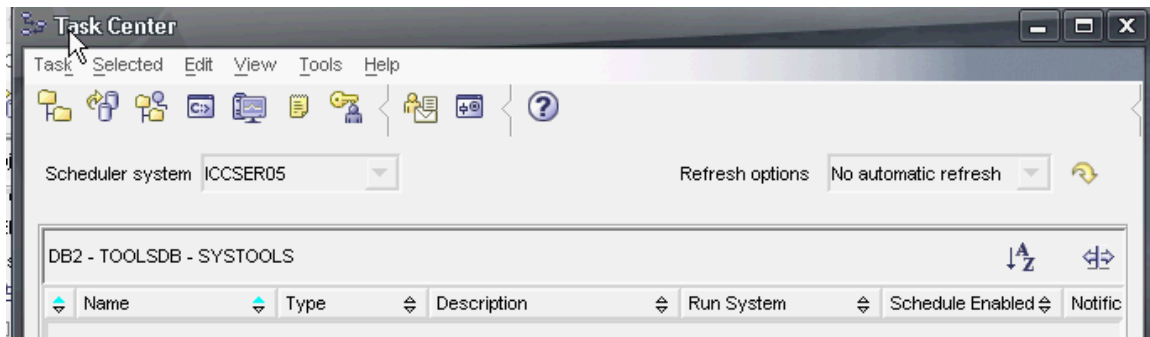
db2 created db SmartTeam on xxxx where xxx is your drive identifier in windows (c;) or your path in UNIX /home/db2instance .

2) either from the task center or from the command line .

### From the task center

Which is accessed by the control center ==> tools





Select the scheduler system and select the job you have saved earlier .

## From the command line

using db2cmd , command shell (UNIX) or the script center of the control center

- db2 -tvf MyGeneratedddlFilename -z outputLogFileName

Assume I have saved my generated ddls in a file called SmarTeam.ddl and it is residing in the current directory

- db2 connect to SmarTeam user USERNAME using PASSWORD
- db2 -tvf SmarTeam.ddl -z SmarTeamcreate.log





## Appendix A : RDBMS Terminology mappings :

### Mapping of Oracle Terminology to DB2 UDB

The following table gives readers who are familiar with Oracle a quick mapping to DB2 UDB terminology:

DB2 UDB	Oracle	Comments
DB2 UDB EE	Oracle EE	Enterprise product.
DB2 UDB EEE	Oracle Parallel	Support node partitioning.
DB2 Connect	Oracle Gateway	DRDA access to hosts.
SQL Control Statements	PL/SQL	Programming language extension to SQL. DB2 UDB stored procedures can be programmed in SQL Control Statements (subset of PSM standard), Java, C, C++, COBOL, Fortran, OLE, and REXX. DB2 functions can be programmed in Java, C, C++, OLE, or SQL control statements.
DB2 CLP	SQL*Plus	Command line interface to the server.
Instance	Instance	Processes and shared memory. In DB2 it also includes a permanent directory structure: an instance is usually created at install time (or can be later) and must exist before a database can be created. A DB2 instance is also known as the <i>database manager</i> (DBM).
Database	Database	Physical structure containing data. In Oracle, multiple instances can use the same database, and an instance can connect to one and only one database. In DB2, multiple databases can be created and used concurrently in the same instance.
DBM and database configuration files, etc.	Control files and .ora files	In Oracle, files that name the locations of files making up the database and provide configuration values. In DB2, each instance (DBM) and database has its own set of configuration parameters stored in a binary file; there are also other internal files and directories: none is manually edited.
Federated System	Database Link	In Oracle, an object that describes a path from one database to another. In DB2 a federated system is used. One database is chosen as the federated database and within it wrappers, servers, nicknames, and other optional objects are created to define how to access the other databases (including Oracle databases) and objects in them. Once an application is connected to the federated database it can access all authorized objects in the federated system.
Table spaces	Table spaces	Contains actual database data.
Containers	Data files	Entities inside the table spaces

Objects	Segments	Entities inside the containers/data files.
Extents	Extents	Entities inside the objects/segments.
Pages	Data blocks	Smallest storage entity in the storage model.
N/A	Clusters	Data structure that allows related data to be stored together on disk; can be table or hash clusters. The closest facility to this in DB2 is a <i>clustering index</i> , which causes rows inserted into a table to be placed physically close to the rows for which the key values of this index are in the same range.
System catalog	Data dictionary	Metadata of the database.
SMS	N/A	System-managed table space.
DMS	Data files	Database-managed table space.
Buffer pools	Data cache	Buffers data in the table spaces to reduce disk I/O.
Package cache	Statement cache	Cache prepared dynamic SQL statements.
Log files	Redo logs	Recovery logs.
N/A	Rollback segments	Store the old version of data for a mutating table. In DB2 the old version of an updated row is stored in the log file along with the new version.
Database manager and database shared memory	SGA	Shared memory area(s) for the database server. In Oracle there is one, while in DB2 there is one at the database manager (instance) level and one for each active database.
Agent / application shared memory	UGA	Shared memory area to store user-specific data passed between application process and the database server.
Package	N/A	A precompiled access plan for an embedded static SQL application stored in the server.
N/A	Package	A logical grouping of PL/SQL blocks that can be invoked by other PL/SQL applications.

## Appendix B. Most used DB2 Commands

### Quick Reference: Common DB2® Command Line Processor

### (CLP) Commands

Maintained by Paul Yip IBM® Toronto Lab November 2002

The following is a quick reference for the most commonly used DB2 CLP commands. While not a complete reference, this document should prove valuable at the desk side of any new DB2 user. Feedback can be sent to [ypaul@ca.ibm.com](mailto:ypaul@ca.ibm.com).

Arguments enclosed in square brackets are optional, and variables are denoted by enclosing angle brackets. For example, the syntax for `CONNECT` is:

```
connect to <dbname>  
[ [user <userid>]  
  using <pwd>]
```

This means that a `CONNECT` to database sample as *user1* using password *mypass* can have the following forms:

```
Connect to sample  
Connect to sample user user1  
Connect to sample user user1 using mypass
```

All commands are organized by their scope. For any CLP command, you may type in the keyword prefixed by a question mark (“?”) to see its full syntax.

Have fun!

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## Instance

CLP Command	Description
db2start	Starts the database manager instance.
db2stop	Stops the database manager instance.
get dbm cfg	Returns the database manager configuration settings.
get dbm cfg show detail	Displays current and delayed values of database manager parameters (as of V8).
update dbm cfg using <p> <v>	Updates the database manager configuration parameter <p> with value <v>.
get instance	Returns the value of DB2INSTANCE environment variable.
list active databases	Lists active databases and number of connections.
list application [show detail]	Returns information about the currently connected applications.
force application (h1 [,h2,...,hn])	Disconnects specific application(s) by handle number.
force application all	Disconnects all applications from the database.
attach to <node> user <userid> using <pwd>	Attaches to remote instance identified by <node> as user <userid> using password <pwd>.

<sup>1</sup> Some parameters take effect immediately. Others require instance stop and restart.

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### Database

<code>create database &lt;dbname&gt;</code>	Creates a database called <dbname>.
<code>activate database &lt;dbname&gt;</code>	Explicitly activates the database.
<code>Deactivate database &lt;dbname&gt;</code>	Explicitly deactivates the database.
<code>connect to &lt;dbname&gt; [ [user &lt;userid&gt;] using &lt;pwd&gt;]</code>	Connects to database <dbname> using explicit user <userid> and password <pwd> if needed.
<code>connect reset</code>	Disconnects from current database.
<code>get db cfg show detail</code>	Displays current and delayed values of database configuration parameters (v8 only).
<code>2get db cfg for &lt;dbname&gt;</code>	Returns the database configuration settings for database <dbname>.
<code>update db cfg for &lt;dbname&gt; using &lt;p&gt; &lt;v&gt;</code>	Updates the database configuration parameter <p> with value <v> for database <dbname>.
<code>list tables [for {user   all   system   schema &lt;schemaname&gt;}] [show detail]</code>	Lists tables in the database. If no arguments are specified, the default is to list the current user's tables.
<code>describe table &lt;tablename&gt;</code>	Displays column information for a table or view.
<code>list tablespaces [show detail]</code>	Displays table space ID, name, type, contents and state.
<code>list tablespace containers for &lt;tablespace_id&gt; [show detail]</code>	Displays container information for the specified table space using <tablespace_id>.
<code>quiesce tablespaces for table &lt;tablename&gt; reset</code>	Resets the state of a table space to normal.

## Connectivity

<code>3catalog [admin] &lt;protocol&gt; node ...</code>	Creates an entry in the node directory for .protocol <protocol>.
<code>list [admin] node directory</code>	Returns contents of the node directory.
<code>4catalog database &lt;dbname&gt;...</code>	Creates an entry in the database directory for database <dbname>.
<code>list database directory [on &lt;path&gt;]</code>	Returns contents of the database directory.

<sup>2</sup> Some parameters take effect immediately. Others require database deactivation and reactivation.

<sup>3</sup> Use “? catalog <protocol>” to get full syntax. For example “? catalog tcPIP”. Be careful: It is possible to catalog a node that does not exist.

<sup>4</sup> Use “? catalog database” to get full syntax. Be careful: It is possible to catalog a database that does not exist.

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## Performance

<code>get monitor switches</code>	Returns the state of the session's monitor switches.
<code>update monitor switches using &lt;monitor&gt; &lt;on off&gt;</code>	Sets the state of the session monitor switch for <monitor>.
<code>5reset monitor all</code>	Resets performance monitor values.
<code>get snapshot for dbm</code>	Returns performance information at the instance level.
<code>6get snapshot for all on &lt;dbname&gt;</code>	Returns all performance information at the database level for database <dbname>.
<code>get snapshot for dynamic sql on &lt;dbname&gt;</code>	Returns the contents of the dynamic SQL cache.
<code>7runstats on table &lt;tbschema&gt;.&lt;tbname&gt;</code>	Gathers statistics for table <tbname>. Table name must be fully qualified with <tbschema>.
<code>8reorgchk on table all</code>	Determines if tables need to be reorganized. Useful for automatically performing <i>runstats</i> on all tables.
<code>reorg table &lt;tablename&gt;</code>	Reorganizes a table by reconstructing the rows to eliminate fragmented data and compacting information.

<sup>5</sup> It is generally recommended to reset monitors before each performance test<sup>6</sup> More snapshot variations are available. More information is available when monitors are on. <sup>7</sup>Use db2rbind to rebind packages using latest statistics <sup>8</sup> Use db2rbind to rebind packages using latest statistics. Use REORG if tables or indexes need to be reorganized.

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## Administration

<code>9export</code>	Extracts database data into a flat file.
<code>10import</code>	Imports data into the database using the IMPORT utility.
<code>11load</code>	Imports data into the database using the LOAD utility.
<code>load query table &lt;tbname&gt; [to local-message-file] [nosummary   summaryonly] [showdelta]</code>	Returns the progress of the LOAD utility.
<code>backup database &lt;dbname&gt; [to &lt;path&gt;]</code>	Performs a database backup.
<code>12restore database &lt;dbname&gt; [from &lt;path&gt;]</code>	Performs a database restore.
<code>get health snapshot for dbm</code>	Returns health snapshot information for instance (v8 only).
<code>13get health snapshot for all on &lt;dbname&gt;</code>	Returns all health snapshots for database <dbname> (v8 only).

## Admin server

<code>get admin cfg</code>	Returns the admin server configuration settings.
<code>update admin cfg using &lt;p&gt; &lt;v&gt;</code>	Updates the admin server configuration parameter <p> with value <v>.

## Application development

<code>get routine into &lt;filename&gt; from [specific] procedure &lt;routine-name&gt; [hide body]</code>	Extracts SQL procedure to binary file.
<code>put routine from &lt;filename&gt; [owner &lt;new-owner&gt; [use registers]]</code>	Deploys SQL procedure from binary file.

<sup>9</sup> See “? export” for more information <sup>10</sup> See “? import” for more information <sup>11</sup> See “? load” for more information <sup>12</sup> If more than one backup image exists at the specified path, the TAKEN AT clause is required. <sup>13</sup> More variations of health snapshots are available. Use “? get health snapshot” for more information.





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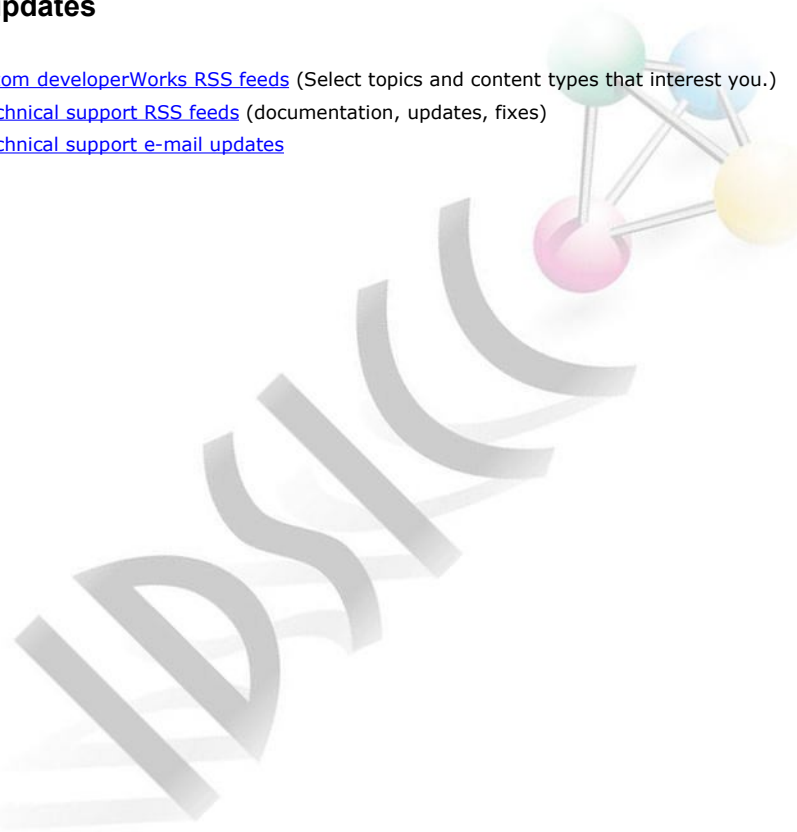
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