



Troubleshooting

IBM Information Management Cloud Computing Center of Competence
IBM Canada Labs

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In this presentation we show you how to troubleshoot problems that may be encountered when working with DB2.

Agenda

- Overview
- The help (?) command
- The DB2 Information Center
- The Administration notification log
- The db2diag.log
- The DB2 Express-C Forum
- Review OS commands
- Search for APARs, technotes

Supporting reading material & videos

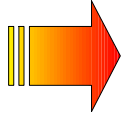
- **Reading materials**

- Getting started with DB2 Express-C eBook
 - Appendix A: Troubleshooting

- **Videos**

- db2university.com course AA001EN
 - Lesson 13: Troubleshooting

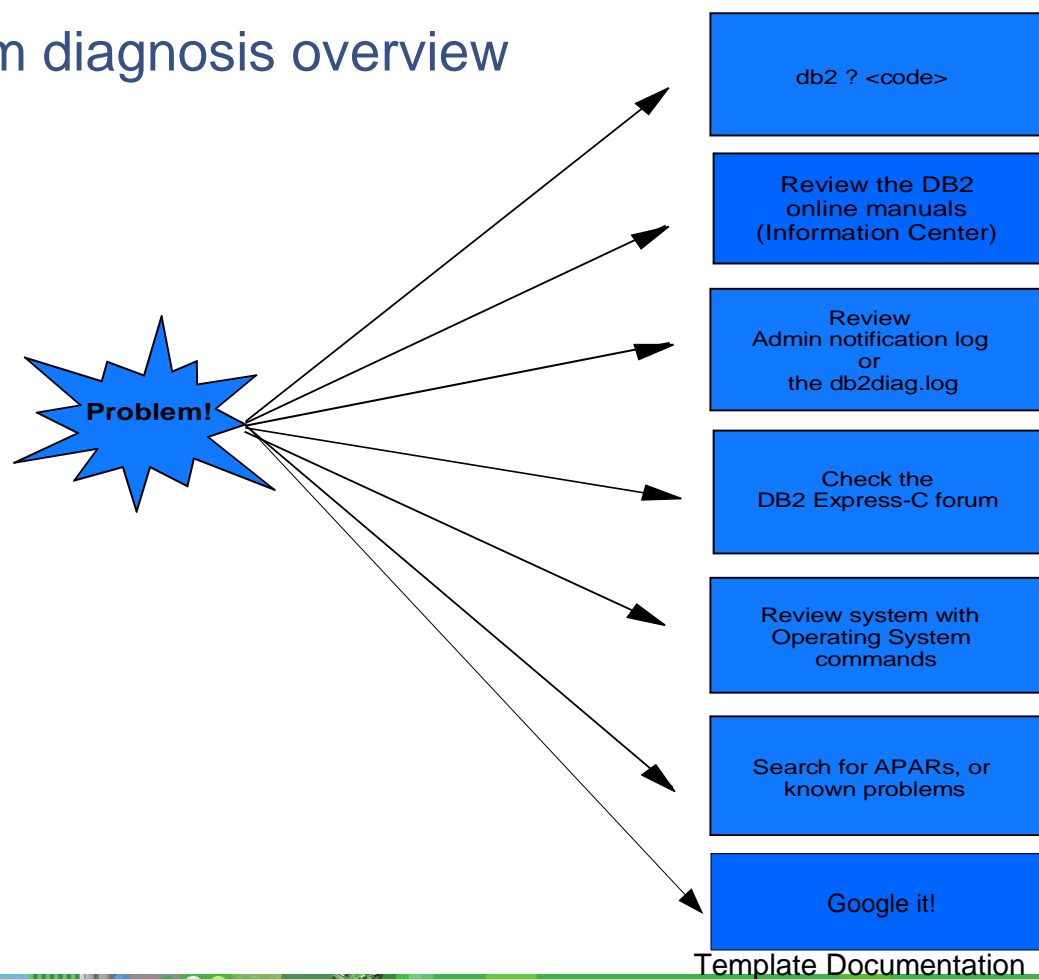
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Problem diagnosis overview



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The figure provides a brief overview of the actions to take should a problem arise. They don't necessarily have to be followed in order.

When you have a problem, if there is an SQLCODE, you can first try to get more information about this code using the help command, which is a "?". We will talk more about this command in the next slides.

A good source of information where you can get most answers are the DB2 manuals (a.k.a Information Center).

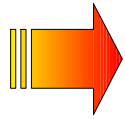
Then you have some diagnostics logs like the admin log, and the db2diag.log the can provide good clues as to what the problem is.

At this point you may want to search in the DB2 Express-C forum for previous reported problems, or ask the community for help. If you have no luck, you can keep researching using operating system commands. For example, there may be an issue with disk space.

Next you can search for APARs (bugs reports) in the product.

As you discover more messages during your diagnostic, make sure to Google them!

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The help (?) command

```
db2 ? SQL0104N
db2 ? SQL104N
db2 ? SQL-0104
db2 ? SQL-104
db2 ? SQL-104N
```

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To obtain more information about an error code received, enter the code prefixed by a question mark. The question mark (?) invokes the DB2 help command. Here, you see several examples of how to invoke it for help if you receive, for example, the SQL error code “-104”. All of the lines shown are equivalent.

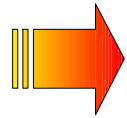
An SQLCODE is a code received after every SQL statement is executed. The meanings of the values are summarized below:

- SQLCODE = 0; the command was successful
- SQLCODE > 0; the command was successful, but returned a warning
- SQLCODE < 0; the command was unsuccessful and returned an error

The SQLSTATE is a five-character string that conforms to the ISO/ANSI SQL92 standard. The first two characters are known as the SQLSTATE class code:

- A class code of 00 means the command was successful.
- A class code of 01 implies a warning.
- A class code of 02 implies a not found condition.
- All other class codes are considered errors.

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DB2 Information Center

- Contains the DB2 online manuals.
- It has a search field
- It can be installed locally, or accessed through the internet
- The internet version is the most up-to-date one:
 - <http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/index.jsp>
- Most of the answers to your questions can be found from the DB2 Information Center!

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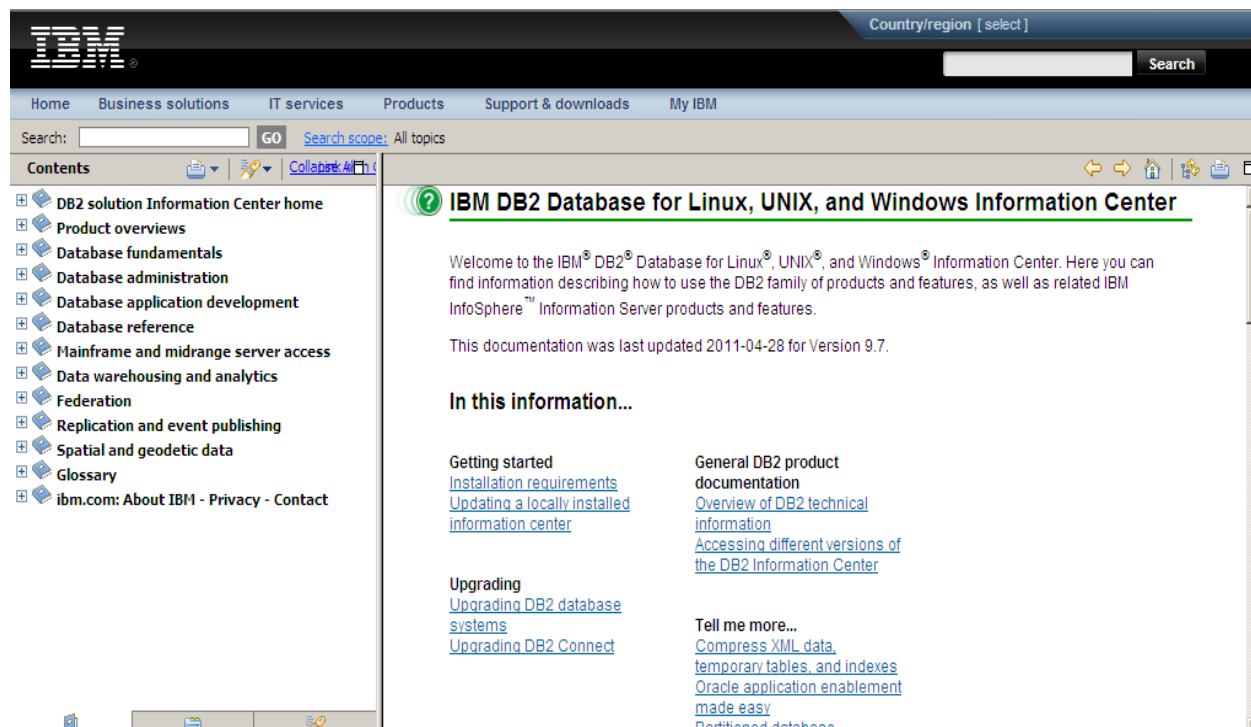
The DB2 Information Center contains the DB2 online manuals. You can use the search field to speed up your search, but be aware of the context of your hits, since the Information Center may have information about related products, not just DB2.

Note there are separate links for the DB2 Information Center of other versions. For example, for DB2 9.5, the link is:

<http://publib.boulder.ibm.com/infocenter/db2luw/v9r5/index.jsp>

Be sure you are looking at the Information Center of the DB2 version you are using.

DB2 Information Center



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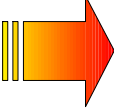
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This is a screenshot of how the DB2 Information Center looks like. As mentioned earlier, use the Search Field to quickly find hits about what you are looking for.

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The administration notification log

- Log with diagnosis information at the point of failure
- On Linux/UNIX platforms, the administration notification log is a text file called instance.nfy
- On Windows, all administration notification messages are written to the Event Log. Use the Event Viewer to review.
- The DBM configuration parameter *notifylevel* specifies the level of information to be recorded:
 - 0 -- No administration notification messages captured (not recommended)
 - 1 -- Fatal or unrecoverable errors
 - 2 -- Immediate action required
 - 3 -- Important information, no immediate action required (default)
 - 4 -- Informational messages

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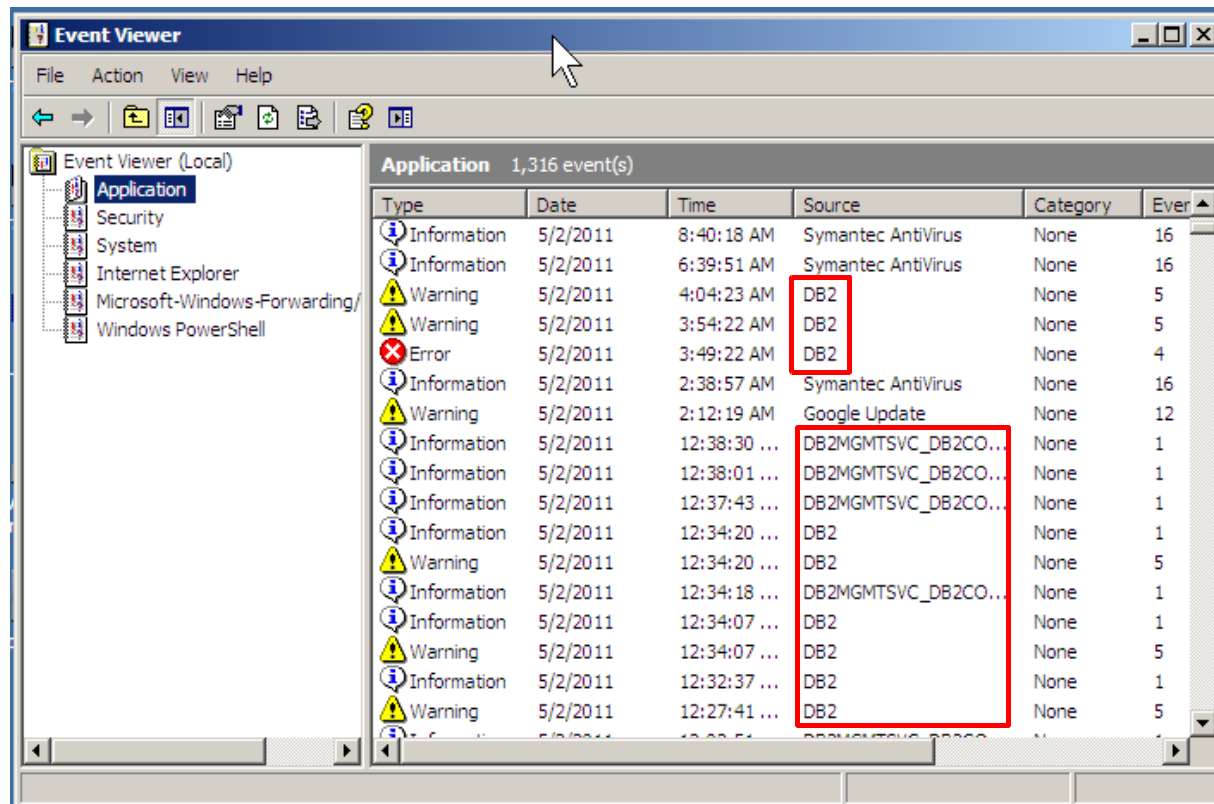
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The DB2 administration notification log provides diagnostic information about errors at the point of failure. On Linux and UNIX platforms, the administration notification log is a text file called <instance name>.nfy (e.g. "db2inst1.nfy"). On Windows, all administration notification messages are written to the Windows Event Log.

The DBM configuration parameter **notifylevel** allows administrators to specify the level of information to be recorded:

- 0 -- No administration notification messages captured (not recommended)
- 1 -- Fatal or unrecoverable errors
- 2 -- Immediate action required
- 3 -- Important information, no immediate action required (the default)
- 4 -- Informational messages

Administration notification log



Windows event viewer with entries for the DB2 administration notification log

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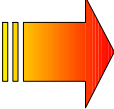
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This screenshot shows the Event Viewer which lists several errors/warning from DB2 (DB2 Admin Notification Log)

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The db2diag.log

- Information included in the db2diag.log
 - The timestamp when the error occurred. Use it to find the error quickly
 - The application name and DB2 function involved in the problem.
 - A diagnostic message explaining the reason for the error.
 - Any available supporting data, such as SQLCA data structures and pointers to the location of any extra dump or trap files.
- If you can recreate the problem:
 - Remove/rename the db2diag.log
 - Recreate the problem. A new db2diag.log file will be generated

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The db2diag.log provides more detailed information than the DB2 Administration notification log. It is normally used only by IBM DB2 technical support or experienced DBAs. Information in the db2diag.log includes:

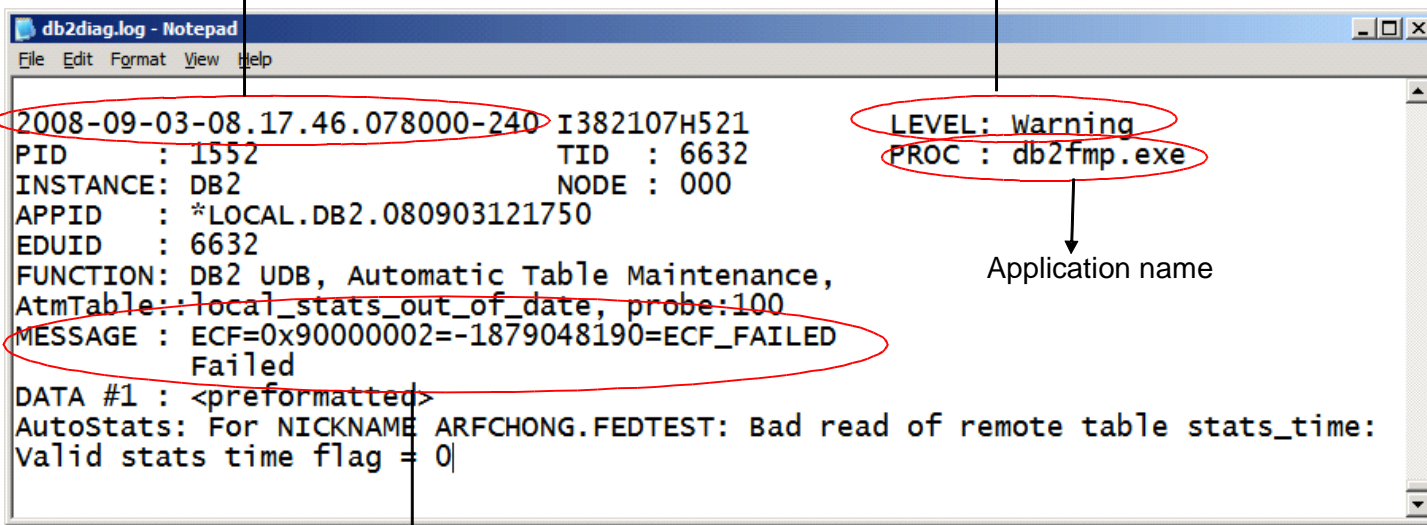
- The DB2 code location reporting an error.
- Application identifiers that allow you to match up entries pertaining to an application on the db2diag.logs of servers and clients.
- A diagnostic message (beginning with "DIA") explaining the reason for the error.
- Any available supporting data, such as SQLCA data structures and pointers to the location of any extra dump or trap files.

Example of a db2diag.log entry

Timestamp when the problem occurred

Level: Be concerned when you see "Severe" or "Error" here.

Application name



The screenshot shows a Notepad window titled 'db2diag.log - Notepad'. The text inside is as follows:

```

2008-09-03-08.17.46.078000-240 I382107H521
PID      : 1552          TID   : 6632
INSTANCE: DB2          NODE  : 000
APPID    : *LOCAL.DB2.080903121750
EDUID    : 6632
FUNCTION: DB2 UDB, Automatic Table Maintenance,
AtmTable::local_stats_out_of_date, probe:100
MESSAGE  : ECF=0x90000002=-1879048190=ECF_FAILED
Failed
DATA #1 : <preformatted>
AutoStats: For NICKNAME ARFCHONG.FEDTEST: Bad read of remote table stats_time:
Valid stats time flag = 0
  
```

Annotations in the image include:

- A red circle around the timestamp `2008-09-03-08.17.46.078000-240` with an arrow pointing to the label "Timestamp when the problem occurred".
- A red circle around `LEVEL: Warning` with an arrow pointing to the label "Level: Be concerned when you see 'Severe' or 'Error' here.".
- A red circle around `PROC : db2fmp.exe` with an arrow pointing to the label "Application name".
- A red circle around the message `MESSAGE : ECF=0x90000002=-1879048190=ECF_FAILED Failed` with an arrow pointing to the label "Error message information. Use any of these for searching in 'Google'".

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This slide shows an example of some of the areas to pay attention to when reviewing a db2diag.log entry. First you should filter entries based on the timestamp, assuming you know when the problem happened. Then discard entries that are not errors. Sometimes the entry can tell you which executable is reporting the problem.

There is a tool called "db2diag" which can be used to filter the db2diag.log based on criteria you specify.

Once you narrow down the entries reporting the problem, you can search in the manuals, or the internet for more clues.

Locating the db2diag.log

- **Windows Vista and later**
 - ProgramData\IBM\DB2\
- **Windows XP/2003 (default)**
 - C:\Documents and Settings\All Users\Application Data\IBM\DB2\DB2COPY1\<instance name>
- **Linux/UNIX (default)**
 - INSTHOME/sqllib/db2dump (INSTHOME is the home directory of the instance owner)
- **You can change the location of the db2diag.log using *diagpath* in the dbm cfg**

Eg: db2 update dbm cfg using diagpath <path>
- **The verbosity of diagnostic text is determined by *diaglevel* in the dbm cfg**
 - range is 0 to 4 (default is 3)
 - most verbose is 4

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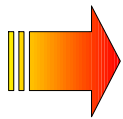
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The db2diag.log is located by default in the directories listed in this slide, or you can change the dbm cfg parameter diagpath to provide a path where you want it stored. The diaglevel dbm cfg parameter is used to indicate how much information you want to collect.

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DB2 Express-C forum

- Free community assistance
www.ibm.com/developerworks/forums/dw_forum.jsp?forum=805&cat=19
- Mainly in English
- The IBM DB2 Express-C team monitors the forum, though it is the community who assists the most
- You can also access it from the DB2 Express-C web site:
www.ibm.com/db2/express
(and click the button to go to the forum)

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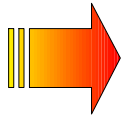
The DB2 Express-C forum is a free community forum where the DB2 community can help you resolve DB2 issues. Though this is a community forum, IBMers monitor the forum, and try to help members in situations where “things are stuck”.

To review entries in the forum you don’t need to register. To post an entry you do have to register, which is free.

The DB2 Express-C forum can be reached through the DB2 Express-C home page at ibm.com/db2/express

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Review operating system (OS) commands

- **For connectivity issues:**

- ***ipconfig /all (Windows)***: Returns the IP address and configuration info).
Use ***ifconfig*** in Linux
- ***ping <IP address/hostname>***: To verify if the network is OK and you can read the other server
- ***hostname***: Returns the host name
- ***netstat -a***: Checks which ports are listening

- **For performance issues:**

- Check the Windows task manager, or use db2top (Linux)
- Check the db2sysc process CPU/memory usage

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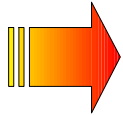
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This slide provides a few OS commands that may help determine where the problem is happening.

Ipconfig, and ping are common commands to use when there are connectivity issues.

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- **Search for APARs, technotes**

Search for APARs and Technotes

- APARs is IBM's recognition of a bug in the product.
- APARs are fixed through fixpacks, however the APAR description may provide a workaround
- If you are using DB2 Express-C (Unwarranted free license) you cannot apply fixpacks. You have to wait until the DB2 Express-C image is refreshed incorporating the fixes
- If you know the APAR number, go to www.ibm.com and input it in the search field to read more about it.
- Google can also help!

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Sometimes a problem you encounter may be caused by a defect in DB2. IBM regularly releases fix packs which contain code fixes for defects (a.k.a APARs). The fix pack documentation contains a list of the fixes contained in the fix pack.

When developing new applications, we always recommend using the latest fix pack to benefit from the latest fixes.

To view your current version and fix pack level, open a DB2 Command Window or Linux shell and, type `db2level`.

Note that fix packs and official IBM DB2 technical support are not offered with DB2 Express-C, With DB2 Express-C, fixes are incorporated into the image itself rather than applied as fix packs.

If you know the APAR number, go to www.ibm.com and input it in the search field to read more about it.

Google can also help!



Thank you!

Use the forum in the db2university.com course AA001EN if you have technical questions about the materials covered in this course. Fellow students, faculty and IBMers can help you!