

# Lesson 1 Transcript: DB2 Installation

## Slide 1:- Cover

Welcome to Lesson 1 of the DB2 on Campus lecture series. Today we're going to talk about installation and the DB2 editions. My name is Raul Chong and I'm the DB2 on Campus Program Manager.

## Slide 2: AGENDA

This is the agenda for today, and we will start with DB2 installation.

## Slide 3: Installation Pre-Requisites

We will be using DB2 Express-C Version 9.5 for installation in this course. DB2 Express-C supports up to 2 cores and 2 gigabytes of RAM. These are the maximums in terms of licensing, but potentially you can install DB2 Express-C on a larger machine and automatically, DB2 Express-C will only use 2 cores at most, and 2 gigs of RAM. In terms of requirements for the operating system, you can take a look at the 2nd link listed in this slide. Now if you want to install DB2 Express-C version 9.5 from Windows, you have to be either a local administrator or you can be a userid that has elevated privileges. If you want to install on Linux, you have to be either root for full support in DB2 Express-C, or you can also install DB2 Express-C on Linux as a non-root user, but you will be limited to some features; so, for example, you will only be able to create one instance, the one that is created at installation time.

## Slide 4: Installation Details

DB2 Express-C is fairly easy to install, and we recommend that you use the GUI wizard, which is the same on all platforms. When you install DB2 on Windows, you just need to execute the **setup.exe** command, which can be found after you unzip the image, that is, unzip the downloadable file that you get from the IBM DB2 Express-C web site, which is [www.ibm.com/DB2/express](http://www.ibm.com/DB2/express). So, once you download that image, you would unzip it. You would then go to that directory, you would go to the EXP directory, the image subdirectory, and then you execute **setup.exe**. Once you install DB2, the code of DB2 would be stored under Program Files > IBM > SQLLIB.

In the case of Linux, you would also untar the tarred version of the image, and once you untar it, you go to the disk1 directory, and then you execute DB2setup as root or non-root, depending on what type of installation you want to perform. Once you install DB2, the code will be installed under `opt/IBMDB2/version9.5`. Now let's assume that I've already installed DB2, and I want to verify where it is that my code is installed. Even though it's mentioned here, you can double-check where it's installed, and you can also check what version of DB2 and what fix pack level you have installed.

## Slide 5: Explorer view

So, for this, let me execute one command; you can open first `db2cmd` which is the DB2 command window on Windows or on the Linux shell. We will also explain this command window or Linux shell in more detail in the following lesson. But from here you can type `db2level` and this will show you first of all that, in my case, I have installed DB2 version 9.5.

It also says the fix pack level, in this case it is fix pack 0, so that means the code is at GA, or general availability, which means we have not applied any fixes on top of this image. And also you will note here that it says “where is the product installed”, so in my case it's installed in `C:\program files\IBM\sqllib`. So, you can run this command from either Linux or windows and you can get this information.

### **Slide 6: Installation Demo**

As part of this installation as well, there is a sample database that is created, and normally I perform some operation on that. I'll show you that in a few minutes. I would like to mention that if you want to see the installation, you can take a look at a installation demo by taking a look at the series called "Lunch with DB2" an episode that shows you how to install DB2 Express-C 9.5; it's a very short demo of about 3 or 4 minutes, so you can go to that link and then quickly take a look at the screen shots of the installation.

### **Slide 7: QuickLab #1 - Installing DB2 Express-C & creating the SAMPLE database**

So now I would invite you to pause this presentation and take a look at the demo I just mentioned, and then try and install DB2 Express-C yourself. As part of this installation, the SAMPLE database, the one I was mentioning before, will be created by default, and with that SAMPLE database you can start playing with DB2. It's a test database used for sample purposes. Now if for any reason you cannot create the sample database or the installation did not create the sample database, you can create it yourself by going to First Steps.

### **Slide 8: First Steps**

So first steps can be invoked by typing `db2fs`, f for first, s for steps, or you can also go to Start > Programs > IBM DB2 > DB2COPY1 and then you can choose Setup Tools > First Steps. Either way will start First Steps, so let's just start First Steps very quickly. And this should have been invoked automatically as well during the installation, the last step of the installation of DB2 Express-C. But over here, if for any reason you were not able to create a SAMPLE database, you can go back here and choose database creation, and then from here you can create SAMPLE database. So you can click on “Create SAMPLE database.” With DB2 version 9.5, this is optional really, you can either choose the first or the second option, XML or SQL objects and data, and then you can specify on which drive you want to install, or on which path, in the case of Linux, and then just click OK. I will click Cancel because I already have this database created.

### **Slide 9: QuickLab #1 ...**

So going back to the presentation, again, pause and install DB2, and once you have installed DB2, let's make sure that the database has been created. So you can do `DB2 connect to sample`, from the same DB2 command window, just to make sure that you can connect to the sample database. So in this case, it shows that I can connect; then you can run a query like `DB2 select * from staff`, for example and press enter. And in my case you can see that I get the correct results, I get some results at least. So you can try this just to make sure you have the sample database, and as well, we're just verifying the installation of DB2 has been successful. You can invoke the graphical tools, and we'll talk later about the graphical tools in more detail, but just invoke the command for the Control Center just by issuing `db2cc` and press Enter, and that should invoke the Control Center. Again, as I was saying, all the graphical tools in DB2 will be covered in more detail in another lesson following this one.

### **Slide 10: Control Center**

Now if you can start the Control Center, probably you'll get a window like this, just type Cancel and then continue, and just verify that you can expand the tree, and that you can see the SAMPLE database; there should just be one database in your case, and that you can click on tables and see some tables. We'll cover this, as I said before, in more detail. So once you've checked this, then probably your installation of DB2 is correct. You can close the Control Center, the Command Editor, and then we can move on to the next slide.

### **Slide 11: Silent Install**

So here we're talking about silent install. What is silent install? Well, during the installation of DB2 there was one panel which asked if you if you wanted to save your responses in a response file. A response file is just a text file that will record all your responses to the installation. So if you say you'll accept the license, it will record that in the information: that you accepted the license. If you choose typical installation or custom installation, it will write that in the text file. So the purpose of this file, is basically, let's say in the future you want to install DB2 to 1,000 computers, you don't want to sit at the 1,000 computers doing the manual installation one by one, and replying to each question that is being asked through the installation process; so what you could do is provide the answers to those questions through this response file.

In the case of Windows, for example, you can issue the command **setup -u** in the response file and then the installation will be a silent install, because you don't need to be sitting at the computer replying to the questions that have been asked. And this is also useful if you're developing an application and you want to install DB2 as part of your application. So you could maybe create a batch file to install your application and as part of that you invoke **setup -u** in the response file to also install DB2 as part of this installation of your application.

### **Slide 12: Sample Response File Code Snippet**

So this is a sample response file—the way it looks. As you can see, in this case, the sample is for Enterprise Server Edition. The license agreement, yes, it was accepted. Then, where do you want to install DB2. It was a custom installation in this example, and so on, and so on.

### **Slide 13: Uninstalling DB2**

So we have finished the installation of DB2. If you have to uninstall DB2, you can just use Add/Remove Programs in Windows. In the case of Linux, the first option is to drop all your databases if you don't want any information about DB2, or no DB2 databases at all, you can just issue a **drop database** command for each database that you have. Then you have to stop the administration server (DAS), remove the administration server, stop all DB2 instances, remove all DB2 instances, and then you can remove the DB2 products by using **./DB2\_deinstall -a**. All of these steps that are mentioned here, like stopping the administration server, stopping the instances, etc. etc. will be covered in lesson number 2 or 3 farther down the road.

### **Slide 14: Agenda**

Moving on to the next section, which is “DB2 servers.”

### **Slide 15: DB2 Server Editions = Packaging**

DB2 servers: there are different editions for DB2 servers and I talk about this a little in one of the speeches as part of this DB2 on Campus lecture series. Now, you can think of an "edition" just as "packaging". So, let's say, you are a small company, you don't need very complex features, but if you are a large company, you probably need very very complex features that will handle or will help handling large amounts of information. So, depending on your needs, you would choose a given edition. So, basically, an edition is just packaging; it's giving users the choice of selecting what package they want, depending on their needs.

Now, DB2 Express-C as you can see from this chart is the core of all the other editions, and DB2 Express-C is the free version of DB2. So basically we're giving to you the core of DB2 for free. When you add more functionality or when more functionality is added to DB2 Express-C, it becomes DB2 Express Edition. When you add more functionality to that, it becomes DB2 Workgroup Edition, and more functionality, it will become DB2 Enterprise Edition.

DB2 Enterprise Edition will probably be used by large companies like a bank. And DB2 Enterprise Edition has a feature called DPF, Database Partitioning Feature, which allows you to spread one database across many many computers or machines, and they have a shared mapping architecture where each computer or machine has its own number of CPUs, its own amount of RAM and disk, so as you spread the database across more and more computers, you can get more and more power.

And there are many more other features like this that would apply for bigger companies. Now, we are using just DB2 Express-C in this course, but basically, it's the base or the core, and most of the things that you would probably use in the case for DB2. So, if you learn DB2 Express-C, you basically have also learned all the other editions because DB2 Express-C is the core of DB2. Also, if you develop an application for DB2 Express-C, the same application with no modification will work on all the other editions, Ok, again, because DB2 Express-C is the core.

### **Slide 16: Same code base for all DB2 server editions**

Now, this chart shows you the code of DB2. In DB2, what we use is the C language to develop the engine of DB2, and we use Java for the graphical tools, the GUI (stands for: Graphical User Interface) tools of DB2. Now, here we're talking about the DB2 engine, and 90% of the code is the same for Linux, UNIX, and Windows. 10% is different because we want to take advantage of operating system specific features, but 90% is the same.

### **Slide 17: DB2 Server Editions = Packaging**

So, what this means, is, if for example, let's say you find a bug in DB2 Express-C on Windows, potentially you could find the same problem on DB2 Enterprise Edition on UNIX, because as I said before, 90% of the code is the same.

### **Slide 18: Upgrading to another DB2 edition**

Now, if you want to upgrade to another DB2 edition, all you need to do is to install the new edition on top, you don't need to worry about your databases, they will not be deleted, they are stored by default on a separate path, and your application does not need to be modified at all. As I said before, if you install DB2 Express-C and then upgrade to another edition, DB2 Express-C is

the core, so the application that you define, or that works with DB2 Express-C would also work with other editions of DB2.

### **Slide 19: DB2 Express-C Edition: Jan. 30th, 2006**

DB2 Express-C was announced on January 30th, of 2006, and as mentioned in my speech, it's free to develop, deploy, distribute, with no limits.

- **Free to develop** means you can develop an application and you can connect to a database, which is DB2 Express-C and you don't need to pay anything to IBM.
- **Free to deploy** means that if you have a production environment and you're using DB2 Express-C in a commercial setting, in production, you can deploy the database in production with no problem. Let's say, you own your own company and you need DB2 to be used in production, there is no problem to use it in production for free.
- **Free to distribute** means you can develop an application and embed DB2 Express-C as part of your application, you can distribute your application, which means as well you are distributing as well DB2 Express-C, and there's no need to pay anything to IBM. The little asterisk (\*) there just means that you would need to register, so you have to perform a registration, which is also free, and that's just required because we want to keep track of the statistics as to what people are doing with DB2 Express-C.

And finally, there are **no limits**, there are no limits in terms of database size, there's no database size limit, there's no limit on the number of instances per server, and there is no user limit. In terms of technology again, DB2 Express-C is the core, the same thing as the other editions, and we include as well, pureXML, so everything with DB2 Express-C is free, including pureXML. In the other editions you have to pay extra for pureXML, but with DB2 Express-C it's all free.

In terms of help, you can get dedicated help from a team, from a dedicated DB2 Express-C team, and also through an online forum, which is also free, and the community will help you. And as I said before in terms of skills, and the applications, they all apply to all editions of DB2, so whatever you develop for DB2 Express-C will apply for other editions of DB2.

### **Slide 20: DB2 Express-C 12 Months License and Subscription**

So this is what I just talked about, we provide free to build, deploy, distribute, pureXML is included, with community assistance, and you can download the image for free, or order a free DVD from the main website of DB2 which is mentioned here at the bottom, [IBM.com/DB2/express](http://IBM.com/DB2/express). Or, if you have your own company, and you want to get IBM support 24\*7 then you can buy this support for \$2,995 US dollars per year, per server, and in addition to that, you get a couple of extra features, which are SQL Replication and High Availability. So, here, these are two different licenses, the one on the left is the one that is free, the one on the right is the one that you have to pay, but you get support. So depending on your needs, you can pick (choose) any of these choices.

### **Slide 21: DB2 Express-C versus other databases**

This is just a quick comparison between DB2 Express-C and different other products, like MySQL Pro, Oracle XE, and SQL Server Express. So, comparing DB2 Express-C with Oracle, and SQL Server Express, and I have highlighted basically this slide here, like memory limits, 32-bit or 64-bit support, and database size limit. In the case of DB2 Express-C, as mentioned before, we have a memory limit of 2 gigs (GB) it's the maximum, 32-bit or 64-bit supported, 2 dual core, and there's no database size limit. In the case of Oracle and SQL Server, they give you a less amount, or the most that you can use in terms of hardware that you can use to install the product is one gig of RAM, 32- and 64- bit in Oracle is supported; but last time that I checked it was still only 32-bit. CPU limit, only one, and database size limit is 4 gig; we have unlimited database size limit. So we're basically giving you more resources and these resources are good enough not only to learn DB2 but also maybe to use it in production.

While in the case of Oracle and SQL Server, normally it would be maybe just to learn their product, but that's it. In the case of MySQL, it may look like they don't have that many restrictions, but we are basically more robust than MySQL, for example, we've been supporting stored procedures for five or six years; MySQL is probably just starting with stored procedures, maybe just for one year. And in terms of performance, we are a better database, more robust database that can provide data performance and we invite you to maybe migrate from MySQL to DB2 and see the performance that you can get. And also in terms of scalability, as well, for example, if you are thinking that your database will be growing and your needs will be growing, then you might as well just start with DB2 Express-C right now, and in the future, eventually you can upgrade to other versions of DB2 that can handle even larger amounts of data.

### **Slide 22: Application Development Freedom**

In terms of support for different languages we say that there's application development freedom because you can code with any of these languages. We provide the drivers and extensions that you need; we include them with DB2 or with the DB2 clients.

### **Slide 23: Agenda**

So we move on to the next section which is DB2 clients.

### **Slide 24: DB2 clients**

And for DB2 clients, we have different clients, like the IBM Data Server client, the IBM Data Server Runtime client, etc. etc. The IBM Data Server Runtime client is the smallest client that is needed to connect to a DB2 for Linux, UNIX, and Windows Server. Then the IBM Data Server client is the same as the IBM Data Server Runtime client but it also includes the graphical tools. Now, note that it says IBM Data Server Client, it doesn't say DB2 client; this is a change that happened from version 9.1 to version 9.5, which means that our clients will not only work with DB2, but with other products of IBM, with other servers of IBM, like Informix.

Then we have DB2 Runtime Client Merge Modules for Windows, this is in the case you want to, let's say, imbed a runtime client with a Windows application. And we also provide the drivers for JDBC and SQLJ, for ODBC and CLI and for .NET as well. So, all of these are free, and you can get them from the DB2 Express-C web site, which is [IBM.com/DB2/express](http://IBM.com/DB2/express). So with all of these you can connect to DB2 for Linux, UNIX, and Windows server. If you want to connect to DB2

for z/OS, which is DB2 on the mainframe server, or DB2 for i5/OS, which is what used to be called the AS/400, you can do that, but you need to get another software product, which is called DB2 Connect. And DB2 Connect for Linux, UNIX, and Windows is not a free product right now.

### **Slide 25: Agenda**

Ok, so moving on to the next section, the last section of this presentation, we're going to talk about other information and fee-based products. So the reason I include this section is because many people here in my lectures or workshops ask me if they can do a given functionality with DB2. And the answer is yes, but in some cases you need some other products.

### **Slide 26: DB2 Fix Packs (old name: Fixpacks)**

So first of all, you may hear the term fix pack; fix pack is basically accumulative fixes; these are used for maintenance, like a service pack, and with DB2 Express-C, you cannot get fix packs if you are using the free license. If you're using the 1-year term license, the one I mentioned was \$2,995 US dollars per server per year, that one allows you to apply fixes or fix packs. So in the case that you're using the free license, even though you cannot apply fix packs, we provide refreshes to the image every now and then. So, if you want to upgrade to the new image, you can just uninstall the previous image and install the new one, or just install on top. Now it is good sometimes just to go to this web site just to check for bugs, but as I said before, if you're using the free unwarranted license of DB2 Express-C, then you will not be able to apply these fixes on top, or the fixes that are mentioned in this link. You will have to wait for the new refresh of the image, and then you have to reinstall that image.

### **Slide 27: Other fee-based related software**

Ok, now other fee-based products are WebSphere Federation Server, WebSphere Replication Server, and DB2 Connect. So, again these are fee-based, so they require payment.

### **Slide 28: WebSphere Federation Server**

Let's start with WebSphere Federation Server. So let's say you want to issue a query like this, `select a.col1, b.col2, c.col3 from oracle-table-a, DB2-table-b, SQL Server-table-c, where ... etc. etc.` So as you can see, what we're doing in this query is that we're accessing three different tables from three different products, from Oracle, from DB2, and from SQL Server, and all of them are being accessed from one single query. So this is possible with WebSphere Federation Server, and WebSphere Federation Server also has some intelligence that would say, ok, should I execute paul.query in Oracle, using their own engine, or should I bring all the data to DB2 and perform all the operations within DB2? And WebSphere Federation Server also includes the client of Oracle, SQL Server, etc. etc., so that it can access those products or the databases on those products.

Now, if you are just working with DB2, let's say you have the same query that I mentioned before, but it's not Oracle, and it's not DB2 on the mainframe. Let's put here, instead of Oracle let's put Informix, and instead of SQL Server, let's say it's DB2 on the mainframe, z/OS, so then the federation functionality is built into the product. So you don't need to buy WebSphere Federation Server when you are not using databases from other vendors. This Informix, DB2, DB2 on the mainframe, for example, are part of the IBM family (you know, Informix was bought

by IBM, so Informix is also part of the IBM family), and in that case you don't need another software product like WebSphere federation server to perform a query that retrieves queries from tables that reside in different products.

### **Slide 29: WebSphere Replication Server**

Ok, WebSphere Replication Server is another product that allows you to replicate information from a source table to a target table. So, this is good for example in the case where you are working let's say in a bank and there are two internal teams in the bank; one team uses OLTP types of workloads, so that means random access of the database, while the other team uses more of a sequential access to the database because they are doing reporting type of operations. These two workloads have a conflict between each other. One way to solve this problem is to use replication where you will be having two separate databases and you replicate from one database to the other and then you can have the OLTP team, the one that performs random access to the database, use one database, and the other database that is doing reporting can use the other database. So that can be one usage of replication. And in WebSphere Replication Server you basically capture all the information from a source table, using the capture program, and then you will be applying those changes to a target table, using the apply program

### **Slide 30: DB2 Connet Server**

Finally we have DB2 Connect. DB2 Connect is another software product that I mentioned already before, and it allows you to connect to DB2 on the mainframe, or to DB2 on the i5/OS, which is what used to be called the AS/400. And again, these are part of the products that are not free, but are very useful if you need to perform these types of operations that I mentioned.

### **Slide 31: What's Next?**

So thank-you for attending or listening to this presentation, and congratulations because you have completed Lesson 1, and as to what is next, it will be continuing with Lesson 2, the DB2 Environment. Thank-you and have a good day.