Overview of Db2

Objectives

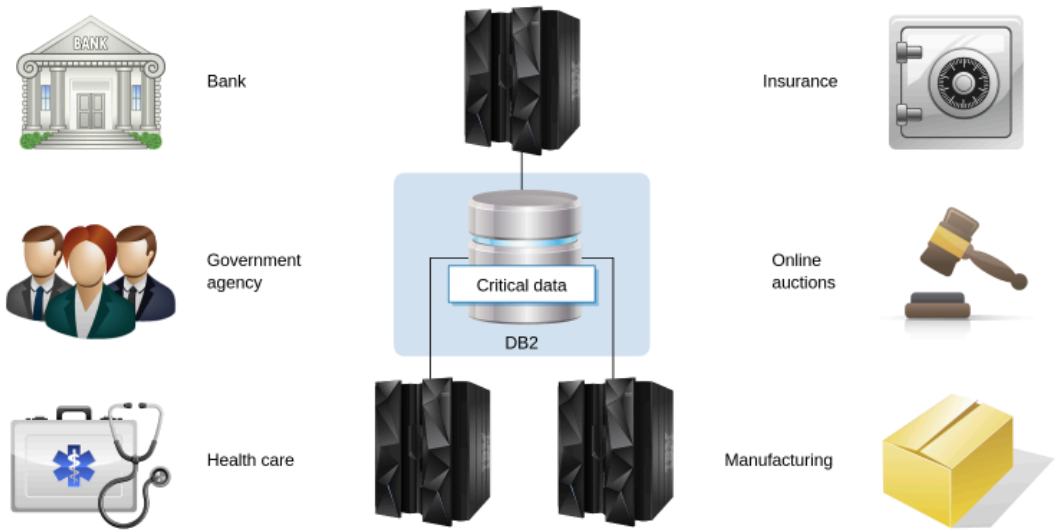
Overview of Db2

In this module, you will be introduced to the Db2 relational database, and you will see how and why it is used across numerous organizations in a z/OS environment. You will discover who interacts with Db2 and the types of tasks they perform.

An overview of the environment that Db2 can operate in and the software and hardware components that comprise Db2 are explained, along with some of the tools used to support it.

After completing this module, you will be able to:

- Explain How a Relational Database Works
- Identify Db2 Users and the Tasks They Perform



It is estimated that the amount of digital data increases at a rate of 60% each year. With 80% of the worlds data processed by mainframes, organizations need to ensure that their data is stored securely and that it can be accessed reliably and quickly.

Organizations such as banks, health care, insurance and Government departments need to be able to share their data between sites and applications and have it available 24 hours a day.

Bank

Health care

Government agency

Online auctions

Many of the organizations mentioned on the previous page have turned to Db2 to manage their data. Today's Db2 can be run on a variety of platforms, but the majority of modules in this course will focus on Db2 for z/OS, which combines a robust relational database (Db2) with the dependability of the mainframe (z/OS).

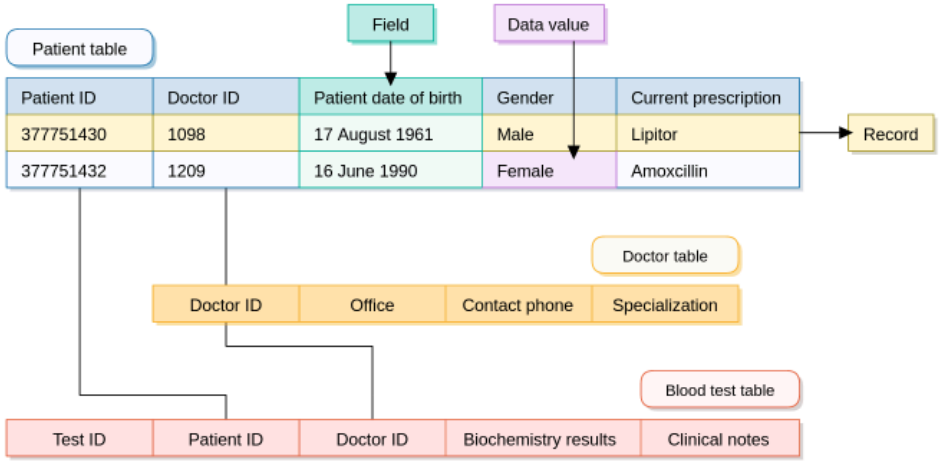
Within this structure, data can be made extremely secure, whilst providing the organization with continuous availability of data and a scalable solution for future data growth.

Mouse-over the examples above to see the types of data issues faced by organizations.

z/OS supports a range of open-standards technologies including Enterprise JavaBeans and XML.

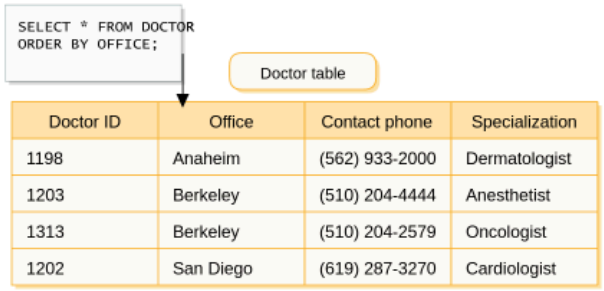
Db2 by itself provides you with a data structure that:

- Is easy to understand. Data from Db2 databases is presented to users in table-like format. This is one of the more familiar ways of displaying data, such as telephone books, and public transport timetables.
- Allows design flexibility. As you can imagine, a table of data is relatively easy to design. All you need to know are the key components of your database, such as Name, Address and Telephone number.
- Provides ease of access. The user is shielded from the internal workings of Db2. Therefore, the user does not need to know the physical relationships of the database they are accessing.



Db2 itself is a relational database, which is basically a collection of related data that is stored in multiple tables that can be reassembled to form meaningful user data.

The example displayed here shows a simple relational database structure for a health care organization. Three tables are displayed that contain doctor, patient and blood test results. In reality there would be anywhere between ten and a thousand tables for this type of organization. The columns of each table form field names, while a row of data values forms a specific record.

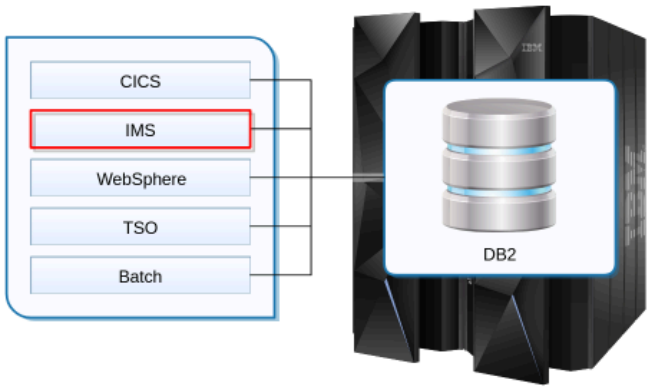


Doctor ID	Office	Contact phone	Specialization
1198	Anaheim	(562) 933-2000	Dermatologist
1203	Berkeley	(510) 204-4444	Anesthetist
1313	Berkeley	(510) 204-2579	Oncologist
1202	San Diego	(619) 287-3270	Cardiologist

The data stored in Db2 is accessed using SQL, which is a computer language specifically designed to communicate with relational databases. SQL is both simple and powerful, since a single SQL statement can generate an entire report, which would take numerous lines of conventional programming code.

As an example, if you wanted to list all doctors and group them by the office they work in, you would need to access the Doctor table using the following SQL statement:
SELECT * FROM DOCTOR
ORDER BY OFFICE;

Click **Play** to see a demonstration of this concept.



IMS is a hierarchical database and information management system that can access DB2 data using the IMS attachment facility.

SQL statements can be invoked from a number of sources if the appropriate interface software to Db2 has been installed.

Common z/OS environment interfaces include TSO, Batch, CICS, IMS and WebSphere. You can also start Db2 sessions from other environments on clients such as Microsoft Windows or UNIX by using interfaces like ODBC, JDBC, and SQLJ.

Mouse-over the items above for more information on the function provided by that interface.

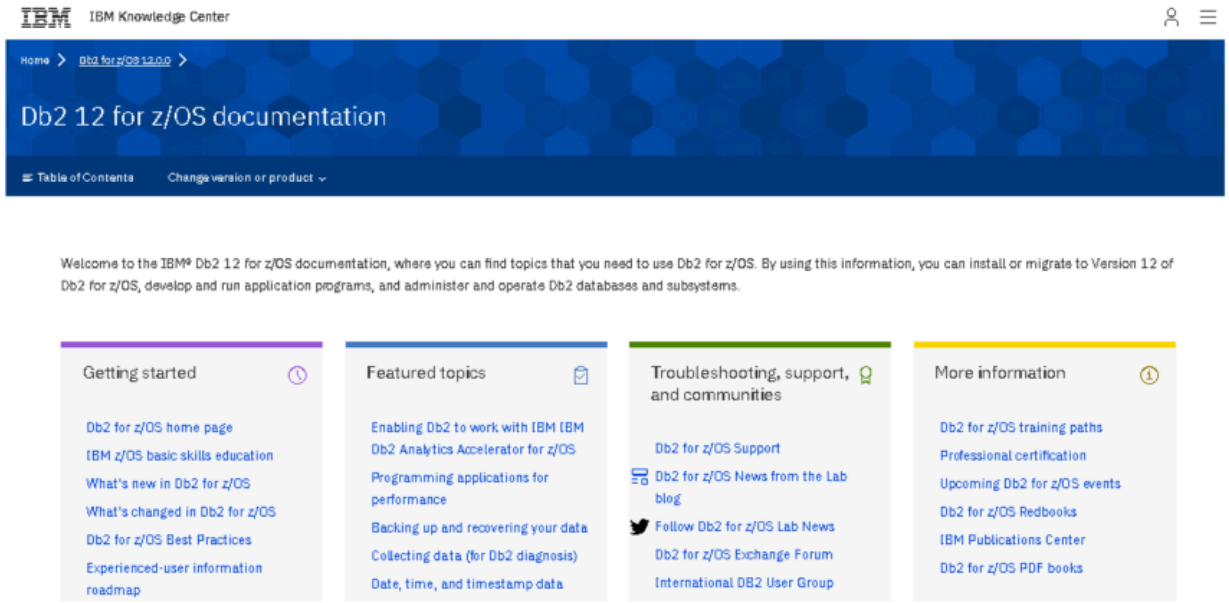
If a problem occurs with Db2 it may be your responsibility to identify the person it is escalated to, so it is important to understand the functions performed by IT personnel who interact with Db2.

Mouse-over the people above for a description on how they use Db2.

If you are working with Db2, then there are a considerable range of options available to keep up to date with Db2 developments and interact with people.

User groups, and their Web sites and resources can benefit you by expanding your resource pool and provides you with exposure to technical personnel with common areas of interest. The International Db2 Users Group is one such organization, whose Web site http://www.idug.org contains information on conferences, blogs and webcasts.

Many individual states have formed their own Db2 user groups making it easier to attend meetings and meet people face to face.



There are a number of sources that provide Db2 users with publications such as technical user guides, useful tips, case studies, and general articles on various Db2 products and utilities.

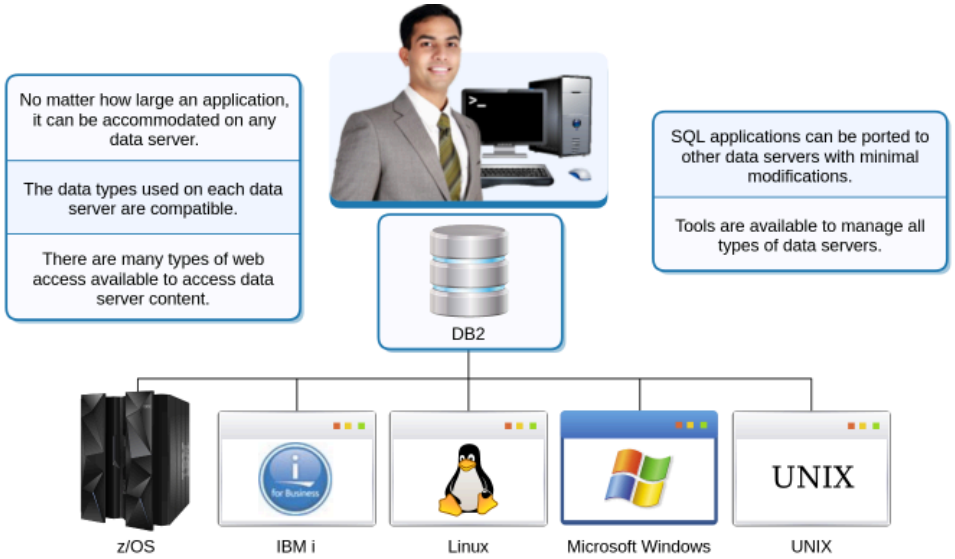
IBM's online Knowledge Center is always a great place to start when looking for in-depth information, while IBM's Db2 product page contains links to articles and blogs on Db2 products. IBM's Systems Magazine will also occasionally contain articles relating to Db2.

A number of non-IBM Db2 publications are also available. At the time of writing this course, Amazon books displayed over 600 results relating to searches for Db2, while sites such as www.databasejournal.com contain useful tips and articles on a wide range of Db2 and other database products.

Whether you are undertaking certification for your own validation, or as part of your organization's overall training roadmap, there is no denying that certification today plays a major role ensuring that individuals have obtained required basic or advanced skills.

Db2 is no different, with IBM supplying a large number of certifications related to this product. Note also that there are many more IBM certifications relating to other Db2 versions or Db2 on platforms other than z/OS.

In this section you will look at some of the other environments in which Db2 can run and discover the major components you will find in a Db2 system. Finally you look at some of the tools used in Db2 database administration, as well as utility, performance, recovery, replication and application management.

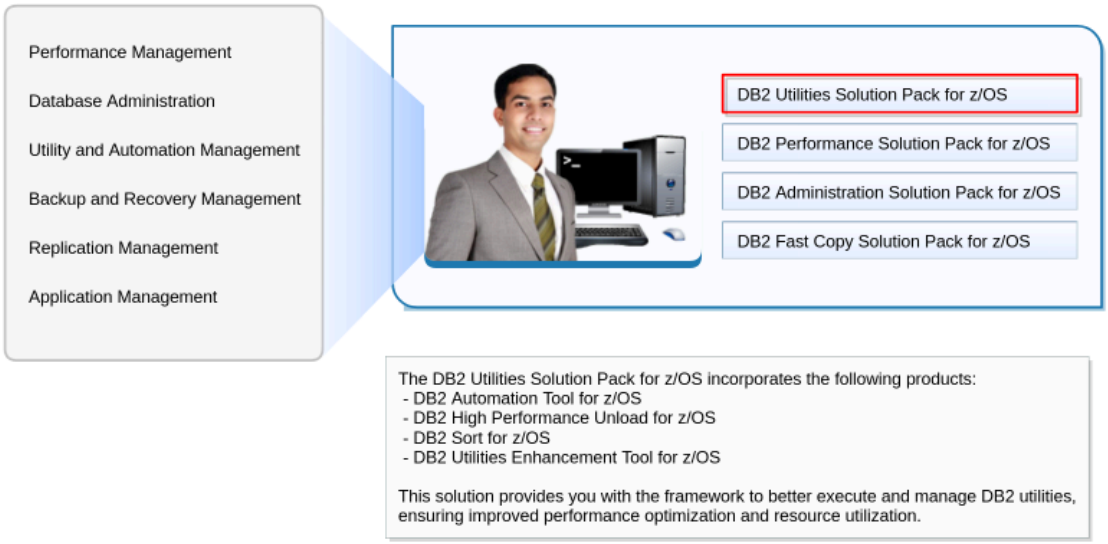


As mentioned previously, Db2, or the Db2 Data Server as it is more commonly known, and its associated products can be implemented and run on a number of different operating systems including: z/OS, IBM i, Linux, UNIX, and Microsoft Windows. This is useful if your organization consists of a mixture of these systems.

While each version above is tweaked to support the individual capabilities of that system, the underlying code is the same allowing data sharing to occur between data servers and application code with minimal modifications.

Data sources	Languages	Clients
IMS	APL2	AIX
Informix	Assembler	Eclipse
Oracle	C	HP-UX
Microsoft® SQL Server, Excel	C++	Linux
Sybase	C#	Solaris
JDBC	COBOL	Windows
Databases that supports JDBC API	Fortran	Web browsers
OLE DB	Java	
Teradata	.NET	
EMC Documentum	Perl	
	PHP	
	PL/I	
	Python	
	REXX	
	Ruby on Rails	
	SQL procedural language	
	TOAD for DB2	
	Visual Basic .NET	

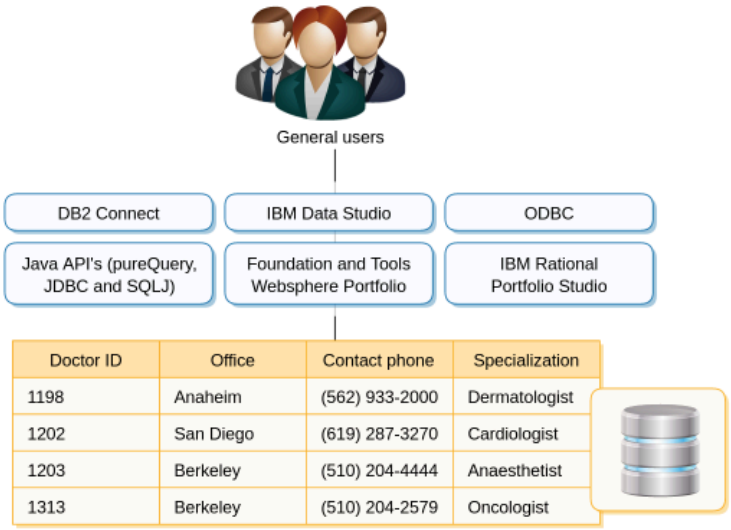
Db2 Data Servers support a large number of different clients and languages, and with additional support can integrate data from other sources.



There is a long list of tools that may be implemented by your organization to support aspects of Db2 for z/OS performance, administration, backup and recovery, automation, replication and application management. Db2 for z/OS includes a comprehensive toolset, but many additional tools are optionally available from IBM as well as from third-party software vendors. The tools shown by the mouse-over function are provided by IBM.

Many of the Db2 for z/OS tools display data using a graphical user interface or ISPF and allow you to perform a number of Db2 tasks interactively.

Mouse-over the IBM Db2 solution packs for a description of their purpose.



Today's on-demand environment requires powerful and efficient middleware products and APIs to define and manage application development and facilitate communication between clients and the Db2 content.

Summary

Overview of Db2

In this module, you saw how data in a Db2 relational database is stored and the benefits it can provide to organizations that install and run it within their z/OS environment. You also discovered the people that interact with Db2 and the types of tasks they perform.

An overview of the environment that Db2 can operate in and the components that comprise Db2 were explained along with some of the tools used to support it.

You should now be able to:

- Explain How a Relational Database Works
- Identify Db2 Users and the Tasks They Perform