

Information Management software



IBM DB2 and Canonical Ubuntu: Your Database Software and OS platform Solution for Enterprise Computing

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Andre Albuquerque (andreda@ca.ibm.com), IBM Canada Lab
Boris Devouge (boris.devouge@canonical.com), Canonical Ltd.
Hua Lu (hualu@ca.ibm.com), IBM Canada Lab

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1. Introduction

IBM® DB2® database for Linux, UNIX and Windows (DB2 or DB2 software) is an enterprise-level relational database management system that is capable of handling demanding workloads, and potentially reducing administration, storage, development, and server costs. With over 20 years of continuous innovation and development by IBM engineers, DB2 software has become one of the few top-notch database management systems in the industry. DB2 software offers reliability and scalability for the changing needs of your business by reducing the minimum requirements of servers running the database, which could help you save on storage, support, database maintenance, and software licensing costs. DB2 Version 9.7.2, released in May 2010, is the latest version of our product, and is the one we focus on in this paper.

As an enterprise-level RDBMS, DB2 9.7 in all its editions shares the same code base across all the distributed platforms; therefore, the DB2 family provides a fast, reliable, and scalable data server to help clients increase their performance smoothly as their businesses grow. For this reason, after acquiring any DB2 license, clients are supported by the same support team around the world that services and supports DB2 Enterprise edition for some of the world's largest companies.

Canonical® Ltd. (Canonical), the company behind the Ubuntu project, provides engineering, online, and professional services to Ubuntu partners and customers worldwide. Canonical is committed to the production and support of its popular and fast-growing open-source operating system. It aims to make its Ubuntu softwares available to every organization and individual on servers, desktops, laptops, and netbooks.

Every six months, Canonical's platform team releases a new Ubuntu edition that harnesses new technologies and the passion and strength of the open-source community to make it quicker and easier to use.

Canonical partners with computer hardware manufacturers to certify that Ubuntu software provides migration, deployment, support, and training services to businesses, and offers online services direct to end users. Canonical also builds and maintains collaborative, open-source development tools to ensure that organizations and individuals can participate fully in innovations within the open-source community. For more information, visit www.canonical.com.

IBM and Canonical have a long history of product integration. By working closely together since DB2 was first supported on Ubuntu 5.04 LTS, IBM and Canonical have shown that the DB2 and Ubuntu products can deliver a stable environment to run critical business applications. Since then, DB2 software has been officially supported in every Ubuntu Long-Term Support (LTS) release. Recently, Ubuntu was officially announced as a recommended Linux distribution for DB2 software. In other words, every Ubuntu LTS release is now included in regular, internal quality assurance test cycles for DB2 products, and has successfully gone through the stringent process whereby IBM ensures that its DB2 products are highly compatible with Ubuntu distributions.

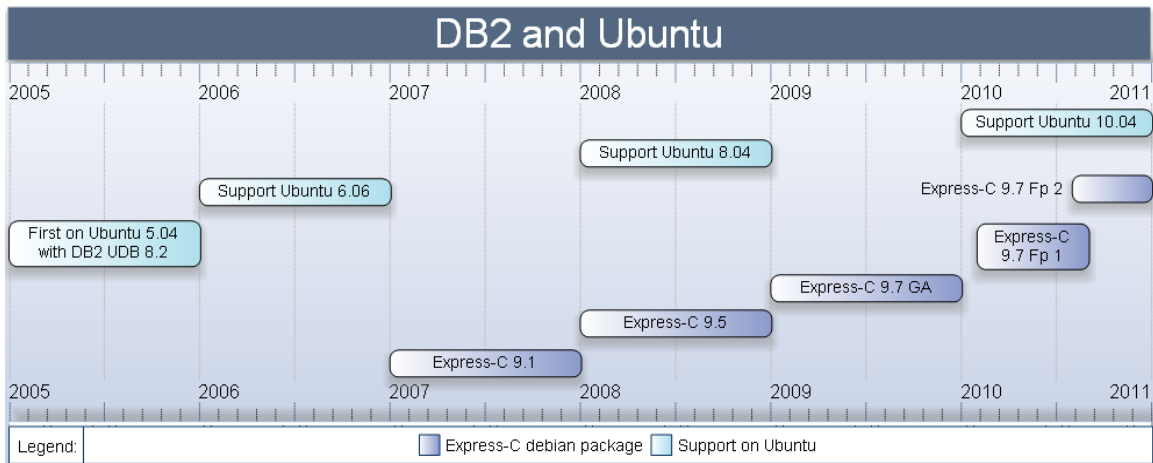


Figure 1. DB2 and Ubuntu product release timeline

This paper will help you to get started with DB2 9.7 on Ubuntu 10.04. You can use this paper to perform the following tasks:

- Understand the differences between all DB2 for Linux, UNIX, and Windows editions.
- Install DB2 9.7 Express-C on Ubuntu 10.04
- Practice simple SQL queries against a sample database.

2. Dive into IBM DB2 Software

2.1 Product Overview

To win in the hard-battling arena of technology and commerce, companies need to collect large amounts of information from various sources and distribute the information to one or more audiences. Such companies need systems that are capable of handling multiple information types, such as XML, message queues, images, and video files, in well-organized structures and with better performance. IBM DB2 software is the heart of Information Management software, which is the core of enterprise computing. DB2 software offers several technology advantages over its competition, such as database partitioning, label-based access control, and IBM pureXML[®] technology, which enables XML data to be stored, processed, and managed in its native hierarchical format to help improve performance. With database partitioning, you can distribute large databases across multiple partitions to increase query performance and reduce processing time when adding or removing large amounts of data. The label-based access control feature offers both high-level and granular security mechanisms for accessing your data. It also offers deep compression features that can save storage space and help improve performance. Additional features ensure that DB2 delivers stable, scalable, secure performance with potentially reduced cost compared with other database system vendors.

Every DB2 edition shares a common code base across all the distributed platforms. So a DB2 database created with the DB2 product can be migrated seamlessly to any edition running on any supported platform. As your business grows, you can easily move your data and DB2 applications to more powerful servers and editions to obtain better performance and more functionality services. All new versions of that product will be available on the Linux, UNIX, and Windows platforms at the same time, so you do not need to delay your upgrade schedule if your applications are deployed on multiple platforms.

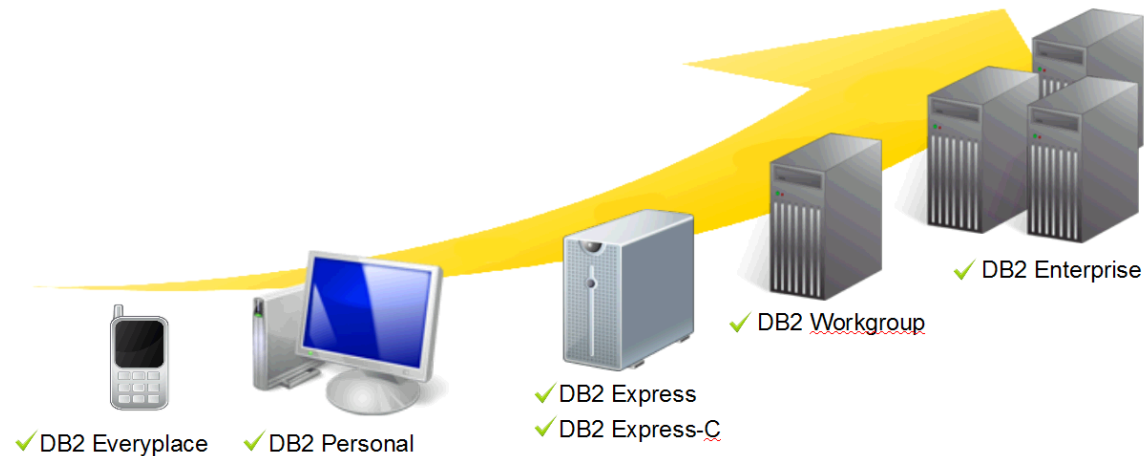


Figure 2. DB2 for Linux, UNIX, and Windows editions

DB2 software comes in a variety of editions to meet different hardware, performance, and storage requirements. They range from DB2 Everyplace, for mobile devices such as PDAs and smart phones, to DB2 Enterprise edition, for medium-sized and large departmental servers and applications that require limitless flexibility and scalability. In this paper, we will focus on the IBM DB2 Linux, UNIX, and Windows family of products, which includes DB2 Express Edition, DB2 Workgroup Server Edition, and DB2 Enterprise Server edition.

2.2 DB2 Editions

2.2.1 DB2 Express-C and DB2 Express Fixed-Term License(FTL)

In January 2006, IBM announced a no charge, community version of its DB2 for Linux, UNIX, and Windows server software—DB2 Express-C. You can use it as part of your production system or simply use it for development and education purposes with no charge.

The latest version of DB2 Express-C is 9.7.2, which was released in May 2010. It can be installed on servers of any size, although it will only use up to 2 CPU cores and 2 GB of memory. There is no limit to the database size and number of users. The robust set of functions provided by DB2 Express-C compares favorably to community editions of database programs offered by other vendors, and includes the following features:

- Full core DB2 capabilities for development and deployment.

- Free administration and development tools, such as control center, command-line editor, and health center.
- Exclusive *pureXML feature* offers sophisticated capabilities to store, process, and manage XML data. With this feature, you do not need to transform, or “shred,” your XML data into tabular structures in the background, so you minimize the performance overhead and simplify your database design.
- Numerous automatic capabilities that can save database administrators' time from many common tasks. These features include Self-Tuning Memory Manager (STMM), automatic storage, automatic maintenance, self-configuration, and health monitoring.

DB2 Express Fixed Term License (FTL) is an add-on subscription offering for DB2 Express-C. In addition to the regular DB2 Express-C functionality, you get the following features when purchasing this add-on:

- Official IBM support offers professional problem resolution and advice 24x7. Also, the fix packs for DB2 Express FTL are released several times a year, while DB2 Express-C only offers full releases at major milestones (e.g. new versions).
- DB2 Express FTL comes with the data replication capability that makes it well suited for replicating data from and to other DB2 data resources.
- DB2 Express FTL offers high availability disaster recovery (HADR) features that allow you to cluster one or more servers to shift workloads and data processing between hot and standby servers to avoid primary system failure.
- DB2 Express FTL allows you to use more computational resources than Express-C edition does. It can use up to 4 CPU cores (2 sockets maximum) and 4 GB of memory, with no limit to the database size or number of users.

Feature	DB2 Express-C Free (UNWARRANTED)	DB2 Express FTL* Paid Subscription
Core DB2 capabilities	YES	YES
Free admin tools	YES	YES
Free development tools	YES	YES
Autonomic capabilities	YES	YES
pureXML feature	YES	YES
No-charge community based assistance***	YES	YES
Official IBM 24x7 support	NO	YES
Fixpacks	NO	YES
High Availability (HADR)	NO	YES
Data Replication	NO	YES
Processor Usage Limit****	2 cores	4 cores (max 2 sockets)
Memory Usage Limit****	2 GB	4 GB
Update Availability	Full release at major milestones	Fixpacks generally every 3 months
Free access to old/current Product images	Yes, until major release only	Product Lifetime
Price per Server per Year**	\$ 0	\$1,990

Figure 3. Comparison of DB2 Express-C and DB2 Express FTL

Note: There is no feature package for DB2 Express-C and DB2 Express FTL. If you need advanced DB2 functionality, such as DB2 advanced access control feature, you need to consider other DB2 editions.

2.2.2 DB2 Express Edition

DB2 Express Edition is an entry-level, full-functionality DB2 data server that is a low-cost, fully IBM supported database software product with a rich applications and services set. Its target users are small and medium-size businesses and independent software vendors (ISVs). DB2 Express Edition offers the following features in addition to the regular Express-C functionality:

- Regular fix pack releases.
- Optimized to use up to 4 processor cores and 4 GB of memory.
- Includes autonomic and remote management features.
- Enabled for cloud computing and virtualization.
- Includes homogeneous federation, homogeneous SQL replication, and backup compression.
- IBM High Availability feature is available to purchase. It includes advance copy service, high availability disaster recovery, online reorganization, and Tivoli® System Automation for Multiplatforms.

2.2.3 DB2 Workgroup Server Edition

DB2 Workgroup Server Edition is a scalable, full-fledged relational database for small and medium-sized businesses that need to handle large and complex workloads. DB2 Workgroup Edition is identical to DB2 Express Edition, with additional features that help process departmental workloads including:

- Up to 16 processor cores (4 sockets) and 16 GB memory.
- Available for multiple platforms, including Linux, Windows, AIX, Solaris.
- High Availability feature pack (Tivoli System Automation, HADR, online reorganization)
- Add-on feature: Performance Expert.

2.2.4 DB2 Enterprise Server Edition

DB2 Enterprise Server Edition is designed for medium-size and large departmental workloads. It is the fully functional premier database server available on a wide range of platforms including Linux, Windows, AIX, Solaris, and HP-UX. It provides scalability, accessibility, and extensibility features. DB2 Enterprise comes with lots of functionality and services in addition to those provided with DB2 Workgroup Server Edition. Some functionality included in the add-on feature packs for DB2 Express and DB2 Workgroup are free with DB2 Enterprise including:

- No memory and processor core limitations.
- Full DB2 features: pureXML, HADR, online reorganization, homogeneous federation, DB2 governor, materialized query table (MQT), multidimensional clustering (MDC), query parallelism, connection concentrator, table partitioning, and more.

DB2 Enterprise Server Edition also has a rich set of feature packs that are not available for other DB2 editions. These feature packs include:

- **Advanced Access Control Feature** offers label-based access control (LBAC) to let you decide exactly who has the authority

to access individual data fields (rows, columns) in a table. The LBAC secure mechanism is transparent to applications and users. For example, users would only see the rows or columns or combinations thereof that they are authorized to see when they query an LBAC-protected table.

- **Performance Optimization Feature** includes three components, DB2 workload manager (WLM) gives you low-overhead, fine-grained control of CPU usage among multiple workloads; IBM Optim performance manager extended edition helps to optimize the performance and availability of mission-critical databases and applications; DB2 Query patroller optimizes the query flow to increase the performance.
- **Storage Optimization Feature** enables transparent data compression on database objects to help reduce the amount of disk space used. It can compress data in six different areas of your database including row compression, value compression, XML compression, index compression, temporary table compression, and backup compression.
- **pureScale™ Feature** offers clustering technology that provides unlimited capacity, application transparency, and continuous availability to customers. It can help minimize database costs and risks as your business grows.
- **Geodetic Data Management Feature Pack** provides spatial data with precise calculation for the curvature of the earth. It treats the earth as “sphere,” unlike DB2 Spatial Extender, which treats the earth as “plane.”

Features	Express FTL	Express	Workgroup Server Edition	Enterprise	Advanced Enterprise
Label Based Access Control	No	No	No	Advanced Access Control Feature	Yes
Geodetic Feature	No	No	No	Geodetic Data Management Feature	Geodetic Data Management Feature
Compression: data / index / XML / temp tables	No	No	No	Storage Optimization Feature	Yes
Workload Management	No	No	No	Performance Optimization Feature	Yes
Query Patroller	No	No	No		No
Performance Expert	No	No	No		No

Homogeneous Replication	Q	No	No	No	Homogeneous Replication Feature for ESE	Replicates single DB2 for LUW source data server to single DB2 for LUW target data server.
Connection Concentrator		No	No	No	Yes	Yes
DB2 Governor		No	No	No	Yes	Yes
Materialized Query Tables (MQT)		No	No	No	Yes	Yes
Multi Dimensional Clustering (MDC) tables		No	No	No	Yes	Yes
Query Parallelism		No	No	No	Yes	Yes
Table Partitioning		No	No	No	Yes	Yes
Advanced Copy Services	Yes	High Availability Feature	Yes	Yes	Yes	Yes
High Availability Disaster Recovery	Yes		Yes	Yes	Yes	Yes
Online Reorganization	Yes		Yes	Yes	Yes	Yes
Tivoli System Automation	Yes		Yes	Yes	Yes	Yes
Compression: backup	Yes	Yes	Yes	Yes	Yes	Yes
Homogeneous Federation	Yes	Yes	Yes	Yes	Yes	Between Oracle and DB2 only
Homogeneous Replication	SQL	Yes	Yes	Yes	Yes	Yes
Net Search Extender		Yes	Yes	Yes	Yes	Yes
pureXML storage		Yes	Yes	Yes	Yes	Yes
Spatial Extender		Yes	Yes	Yes	Yes	Yes
Optim Development Studio		Yes	Yes	Yes	Yes	Yes
Optim Database Administrator		Yes	Yes	Yes	Yes	Yes

Figure 4. DB2 features and functionality by edition

3. Installation and Instructions

3.1 Debian Package Introduction

The best way to install DB2 software on the Ubuntu operating system is to take advantage of the very powerful APT package management system. Debian packages are standard UNIX archives that include two gzipped, bziped or lzmaed tar archives: one that holds the control information and another that contains the data. ".deb" is the extension of the Debian software package format and the most often used name for such binary packages. Debian packages are also used in distributions based on Debian, such as Ubuntu and others. By installing Debian packages using this system, the end user can control, maintain, and integrate the software easily while ensuring that all software dependencies are met. It also provides an easy way to upgrade software and make changes to configuration files.

3.2 Prerequisites

Before proceeding, ensure that you have provisioned an Ubuntu 10.04 LTS environment that is ready to use and up-to-date. Read this section carefully and complete all actions required to adequately prepare your system for DB2 installation.

CPU Requirements for DB2

- x86 (Intel Pentium, Intel Xeon, and AMD) 32-bit Intel and AMD processors.
- x64 (64-bit AMD64 and Intel EM64T processors).
- IBM POWER[®] (IBM eServer[™] OpenPower[®], iSeries[®], pSeries[®], System i[®], System p[®], and POWER Systems[™] that support Linux).
- eServer System z[®], System z9[®] or System z10[™].

Memory Requirements for DB2

- Minimum 256 MB RAM (with command-line installation) / 512 MB RAM (with GUI installation).
- Recommended: 1 GB RAM.

Disk Requirements for DB2

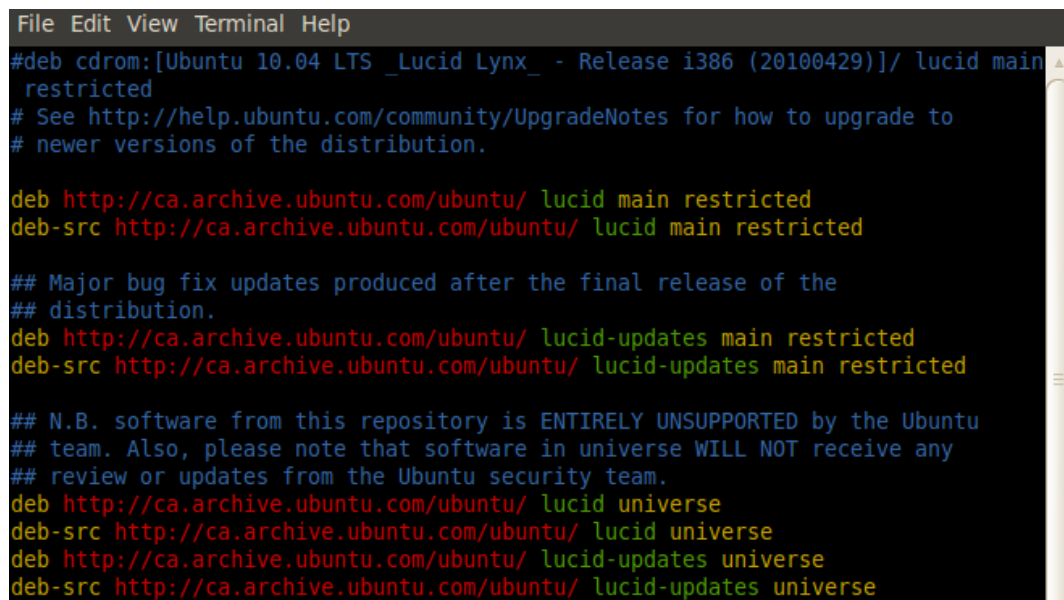
- Product installation: 400 MB.
- Recommended 2 GB free space in /tmp directory.

3.3 How to Install DB2 Express-C with Debian Package

There are several ways to install DB2 Express-C on the Ubuntu operating system: you can download the latest installation files from the following link: <http://www.ibm.com/software/data/db2/express/> Alternatively, you can choose to use the installation Debian packages, which is as easy as issuing a single line command in the terminal. The DB2 Express-C Debian package will install the DB2 software and set up an instance, users, and several database configurations by default. If a previous version exists, the installation will upgrade it while keeping the database objects untouched. You can follow the steps below to install or upgrade your DB2 Express-C software.

1. Before you start the installation, you need to add the **Canonical Partner Repository** into the `/etc/apt/sources.list` file, which contains a list of repositories from which your system can download programs. (Note: If the Canonical partner repository has already been added, go to Step 4.) Open the sources.list file in an editor. (we will use vi in the following steps):

sudo vi /etc/apt/sources.list



```
File Edit View Terminal Help
#deb cdrom:[Ubuntu 10.04 LTS _Lucid Lynx_ - Release i386 (20100429)]/ lucid main
restricted
# See http://help.ubuntu.com/community/UpgradeNotes for how to upgrade to
# newer versions of the distribution.

deb http://ca.archive.ubuntu.com/ubuntu/ lucid main restricted
deb-src http://ca.archive.ubuntu.com/ubuntu/ lucid main restricted

## Major bug fix updates produced after the final release of the
## distribution.
deb http://ca.archive.ubuntu.com/ubuntu/ lucid-updates main restricted
deb-src http://ca.archive.ubuntu.com/ubuntu/ lucid-updates main restricted

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team. Also, please note that software in universe WILL NOT receive any
## review or updates from the Ubuntu security team.
deb http://ca.archive.ubuntu.com/ubuntu/ lucid universe
deb-src http://ca.archive.ubuntu.com/ubuntu/ lucid universe
deb http://ca.archive.ubuntu.com/ubuntu/ lucid-updates universe
deb-src http://ca.archive.ubuntu.com/ubuntu/ lucid-updates universe
```

2. Look for the following lines in the file:

```
deb http://archive.canonical.com/ubuntu lucid partner  
deb-src http://archive.canonical.com/ubuntu lucid partner
```

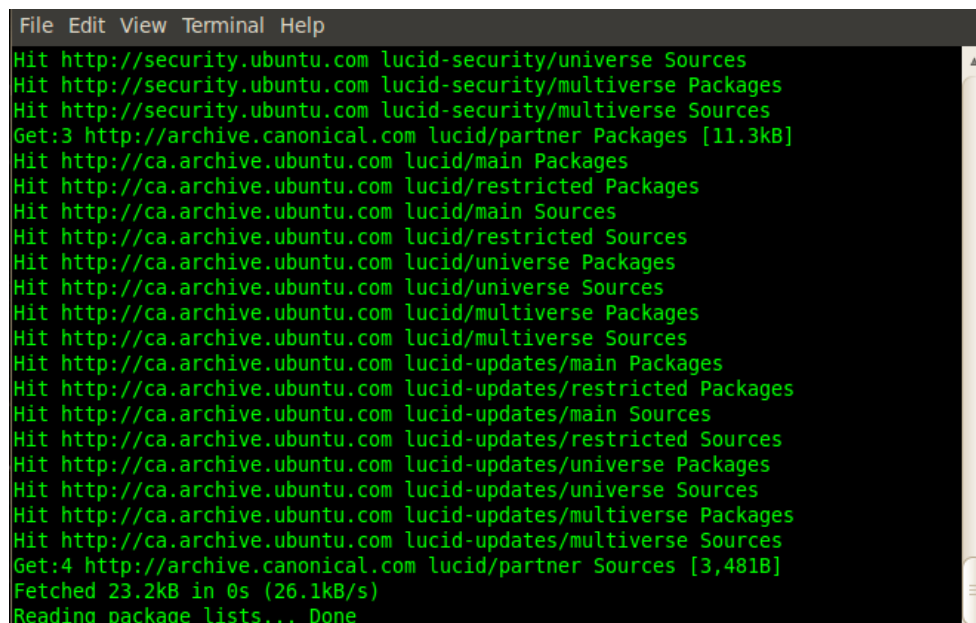
```
## Uncomment the following two lines to add software from Canonical's  
## 'partner' repository.  
## This software is not part of Ubuntu, but is offered by Canonical and the  
## respective vendors as a service to Ubuntu users.  
deb http://archive.canonical.com/ubuntu lucid partner  
deb-src http://archive.canonical.com/ubuntu lucid partner
```

If they are commented out (has “#” at the beginning of each line), remove the “#” from the beginning of each line. If you cannot find the lines, add them to the end of the file, and then save and exit the editor.

3. After modifying the **sources.list** file, you need to update the repositories so that your Ubuntu environment can have the most updated package list available from all repositories listed in the **sources.list** file. Execute the following command to update the list:

```
sudo apt-get update
```

Depending on your network speed, the update process may take several minutes. You can check whether the partner repository package lists were downloaded by looking at the logs displayed on the screen. You should have something very similar to the picture below.



```
File Edit View Terminal Help  
Hit http://security.ubuntu.com lucid-security/universe Sources  
Hit http://security.ubuntu.com lucid-security/multiverse Packages  
Hit http://security.ubuntu.com lucid-security/multiverse Sources  
Get:3 http://archive.canonical.com lucid/partner Packages [11.3kB]  
Hit http://ca.archive.ubuntu.com lucid/main Packages  
Hit http://ca.archive.ubuntu.com lucid/restricted Packages  
Hit http://ca.archive.ubuntu.com lucid/main Sources  
Hit http://ca.archive.ubuntu.com lucid/restricted Sources  
Hit http://ca.archive.ubuntu.com lucid/universe Packages  
Hit http://ca.archive.ubuntu.com lucid/universe Sources  
Hit http://ca.archive.ubuntu.com lucid/multiverse Packages  
Hit http://ca.archive.ubuntu.com lucid/multiverse Sources  
Hit http://ca.archive.ubuntu.com lucid-updates/main Packages  
Hit http://ca.archive.ubuntu.com lucid-updates/restricted Packages  
Hit http://ca.archive.ubuntu.com lucid-updates/main Sources  
Hit http://ca.archive.ubuntu.com lucid-updates/restricted Sources  
Hit http://ca.archive.ubuntu.com lucid-updates/universe Packages  
Hit http://ca.archive.ubuntu.com lucid-updates/universe Sources  
Hit http://ca.archive.ubuntu.com lucid-updates/multiverse Packages  
Hit http://ca.archive.ubuntu.com lucid-updates/multiverse Sources  
Get:4 http://archive.canonical.com lucid/partner Sources [3,481B]  
Fetched 23.2kB in 0s (26.1kB/s)  
Reading package lists... Done
```

After the update, your Ubuntu environment is ready to download and install the DB2 Express-C 9.7 Debian package. The package requires some other Debian packages to be installed, for example, C++ libraries. All the dependencies will be automatically downloaded and installed during the DB2 installation.

4. To start DB2 Express-C installation, execute the following command:

sudo apt-get install db2exc

```
File Edit View Terminal Help
ubuntu@ubuntu-desktop:~$ sudo apt-get install db2exc
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  ksh libaiol libasound2-dev libpthread-stubs0 libpthread-stubs0-dev
  libx11-dev libxau-dev libxcb1-dev libxdmcp-dev x11proto-core-dev
  x11proto-input-dev x11proto-kb-dev xtrans-dev
Suggested packages:
  libasound2-doc
The following NEW packages will be installed:
  db2exc ksh libaiol libasound2-dev libpthread-stubs0 libpthread-stubs0-dev
  libx11-dev libxau-dev libxcb1-dev libxdmcp-dev x11proto-core-dev
  x11proto-input-dev x11proto-kb-dev xtrans-dev
0 upgraded, 14 newly installed, 0 to remove and 267 not upgraded.
Need to get 308MB of archives.
After this operation, 776MB of additional disk space will be used.
Do you want to continue [Y/n]? Y
```

Type “Y” to continue.

```
Setting up libaiol (0.3.107-3ubuntu2) ...
Setting up libasound2-dev (1.0.22-0ubuntu7) ...
Setting up db2exc (9.7.2-10) ...
 * Setting DB2 library path... [ OK ]
 * Registering installation in the DB2 global registry... [ OK ]
 * Creating new group and user for Database Administration Server... [ OK ]
 * Creating Database Administration Server... [ OK ]
 * Creating new group and users for DB2 instances... [ OK ]
 * Creating default instance... [ OK ]
 * Updating DBM configuration for db2inst1... [ OK ]
 * Adding instance information to /etc/services... [ OK ]
 * Creating symbolic links... [ OK ]
 * Installing DB2 Express-C Edition 9.7 license... [ OK ]
DB2 Express-C Edition 9.7 Fix Pack 2 for Linux i386 has been installed in /opt/i
bm/db2/V9.7.
The following DAS user has been configured:
dasusr1
The following instances have been configured:
db2inst1
For more details, consult DB2 Information Center.
http://publib.boulder.ibm.com/infocenter/db2luw/v9r7
 * Starting DAS: done.
 * Instance db2inst1 ( db2c_db2inst1 ): done.
Processing triggers for libc-bin ...
ldconfig deferred processing now taking place
ubuntu@ubuntu-desktop:~$
```

The installation will take several minutes to finish, depending on your network speed. The DB2 software will automatically configure users, groups, license, and communications during the installation. Once completed, the installation process will start the default Database Administration Server (DAS) and the default instance (***db2inst1***).

3.4 Verify the Installation – Sample Database

After the installation completes, you can verify that your database was installed correctly using a simple DB2 command to create a sample database for verification. The following steps show you how to create the sample database and query data from it.

1. Login as the default instance user, ***db2inst1***

sudo su - db2inst1

```
ubuntu@ubuntu-desktop:~$ sudo su - db2inst1
[sudo] password for ubuntu:
db2inst1@ubuntu-desktop:~$ █
```

2. Issue the command below to create the sample database. It might take couple of minutes to finish the creation.

db2sampl

```
db2inst1@ubuntu-desktop:~$ db2sampl
Creating database "SAMPLE"...
Connecting to database "SAMPLE"...
Creating tables and data in schema "DB2INST1"...
Creating tables with XML columns and XML data in schema "DB2INST1"...

'db2sampl' processing complete.
db2inst1@ubuntu-desktop:~$
```

3. Connect to “Sample” database.

db2 connect to sample

```
db2inst1@ubuntu-desktop:~$ db2 connect to sample

Database Connection Information

Database server          = DB2/LINUX 9.7.2
SQL authorization ID    = DB2INST1
Local database alias    = SAMPLE

db2inst1@ubuntu-desktop:~$ █
```


4. Now, you can start querying the database.

db2 list tables

*db2 “select * from emp”*

If the data can be retrieved, as shown below, your DB2 Express-C installation was successful. You can start testing various features against the sample database, or create a new database with specific parameters.

```
SALES          DB2INST1      T      2010-09-02-10.08.02.358834
STAFF          DB2INST1      T      2010-09-02-10.08.02.098136
STAFFG        DB2INST1      T      2010-09-02-10.08.03.937472
SUPPLIERS     DB2INST1      T      2010-09-02-10.08.13.815963
VACT          DB2INST1      V      2010-09-02-10.08.02.875682
VASTRDE1     DB2INST1      V      2010-09-02-10.08.02.892347
VASTRDE2     DB2INST1      V      2010-09-02-10.08.02.894833
VDEPMG1      DB2INST1      V      2010-09-02-10.08.02.884053
VDEPT        DB2INST1      V      2010-09-02-10.08.02.842439
VEMP         DB2INST1      V      2010-09-02-10.08.02.868824
VEMPDPT1     DB2INST1      V      2010-09-02-10.08.02.888670
VEMPLP       DB2INST1      V      2010-09-02-10.08.02.912571
VEMPPROJACT  DB2INST1      V      2010-09-02-10.08.02.881644
VFORPLA      DB2INST1      V      2010-09-02-10.08.02.903525
VHDEPT       DB2INST1      V      2010-09-02-10.08.02.867100
VPHONE       DB2INST1      V      2010-09-02-10.08.02.910027
VPROJ        DB2INST1      V      2010-09-02-10.08.02.873933
VPROJACT     DB2INST1      V      2010-09-02-10.08.02.877511
VPROJRE1    DB2INST1      V      2010-09-02-10.08.02.896817
VPSTRDE1     DB2INST1      V      2010-09-02-10.08.02.898694
VPSTRDE2     DB2INST1      V      2010-09-02-10.08.02.901584
VSTAFAC1     DB2INST1      V      2010-09-02-10.08.02.906010
VSTAFAC2     DB2INST1      V      2010-09-02-10.08.02.908030

  47 record(s) selected.

db2inst1@ubuntu-desktop:~$ █
```

4. Support and Reference

IBM offers a wide range of support options for the DB2 product family, such as technical documents, self-study materials, and communities. You can use the following links to obtain information about DB2 software.

IBM DB2 9.7 Information Center:

<http://publib.boulder.ibm.com/infocenter/db2luw/v9r7/index.jsp>

IBM Redbooks® publications:

<http://www.redbooks.ibm.com/>

Information Management Training

<http://www.ibm.com/software/data/education/selfstudy.html>

IBM developerWorks® website:

<http://www.ibm.com/software/data/education/selfstudy.html>

IBM Information Management Learner Portal

<http://eb90.elearn.ihost.com/wps/portal/ibm>

IBM Information Management Bootcamps:

<http://www.ibm.com/developerworks/data/bootcamps>

IBM and Ubuntu

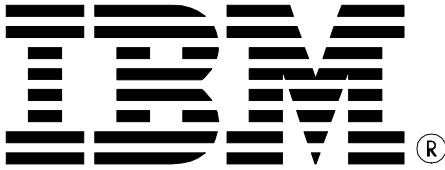
<http://www.ubuntu.com/partners/ibm>

Ubuntu 10.04 LTS Server

<http://www.ubuntu.com/server>

Ubuntu Server guide:

<https://help.ubuntu.com/10.04/serverguide/C/index.html>



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IBM Canada
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Canada

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