

Upgrading to Version 11.1 of IBM Db2 for Linux, UNIX, and Windows

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1 Introduction

Purpose

This document explains how you upgrade your database to Version 11.1 of Db2 for Linux, UNIX, and Windows if your database is Db2 Version 9.7, Db2 Version 10.1, or Db2 Version 10.5 for Linux, UNIX, and Windows. It contains specific information and recommendations for SAP system environments.

For more information about the upgrade to Db2 Version 11.1 for Linux, UNIX, and Windows, see the document *Upgrade to Db2 Version 11.1* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/c0023662.html.

Note

- Before you start the database upgrade, make sure that you read SAP Note [2311008](#). This SAP Note contains the most recent information about the database upgrade, as well as corrections to this document. Make sure that you always have the most recent version of this SAP Note.
- For a list of known errors and available fixes in Db2 Version 11.1, see also SAP Note [2311008](#).

Upgrade Process

To upgrade the database to Db2 Version 11.1, make sure that you perform these steps in the following order:

1. Plan the upgrade and check the requirements.
2. Install the Db2 11.1 database software.
3. Upgrade the Db2 instance.
4. Upgrade the Db2 database.
5. Perform post-upgrade activities.

These steps are described in detail for Linux/UNIX and for Windows in the appropriate sections.

1.1 What's New in Db2 11.1

Db2 11.1 offers the following new features:

- **Enhancements for Column-Organized Tables**
Db2 11.1 introduces several enhancements to the use of column-organized tables. You can now use column-organized tables, for example, in partitioned database environments.
- **Db2 pureScale Feature Enhancements**
Enhancements for the pureScale Feature include a simplified installation and deployment process and a new health check.

- **New Upgrade Possibilities**

It's now possible to upgrade from the previous three Db2 releases (Db2 9.7, Db2 10.1, and Db2 10.5) **directly** to Db2 11.1. When upgrading from a Db2 10.5 FP 7 or higher single-partition server, a full offline backup is no longer required as Db2 is now able to roll forward through a database version upgrade.

- **Online Reorganization of Range-Partitioned Tables**

A single partition of a range-partitioned table can now be reorganized online (using the `INPLACE` option of the `REORG` command) if all indexes of the table are also partitioned.

- **HADR Encryption**

Communication in an HADR setup can now be encrypted via SSL protocol.

For more information about the support of new features of Db2 11.1 in your SAP system, see SAP Note [2303763](#)



If you're interested in what was new with previous Db2 releases, see the relevant upgrade guide at <https://help.sap.com/viewer/p/DB6>.

1.2 Document History

Caution

Before you start the implementation, make sure you have the latest version of this document. You can find it at https://help.sap.com/viewer/db6_upgrade_11_1 on [SAP Help Portal](#). On the webpage, there's also a button to download the [PDF version](#) of this guide.

The following table provides an overview of the most important document changes:

Version	Date	Description
1.3	2018-02-12	Minor updates only, for example, links to SAP Service Marketplace replaced by links to SAP Help Portal . Section References [page 46] added
1.2	2017-08-24	Information in Upgrade Requirements [page 8] was added: <code>dmdb6b.kp</code> is no longer part of the SAP delivery with kernel 7.40 and higher. Section Post-Upgrade Activities for Near-Line Storage (NLS) Systems [page 44] was added.
1.1	2017-01-17	Update of section <i>SAP System-Specific Requirements</i> in chapter Upgrade Requirements [page 8] (regarding SAP Kernel releases)

Version	Date	Description
1.0	2016-08-01	Initial version

1.3 Naming Conventions

Throughout this documentation, we use some naming conventions for IBM DB2 and the SAP application server, and variables.

IBM Terminology

The Db2 database versions are referred to as follows:

Database Version	Short Name
<i>IBM Db2 Version 11.1 for Linux, UNIX, and Windows</i>	<i>Db2 11.1</i>
<i>IBM Db2 Version 10.5 for Linux, UNIX, and Windows</i>	<i>Db2 10.5</i>
<i>IBM Db2 Version 10.1 for Linux, UNIX, and Windows</i>	<i>Db2 10.1</i>
<i>IBM Db2 Version 9.7 for Linux, UNIX, and Windows</i>	<i>Db2 V9.7</i>

With Db2 11.1, IBM introduced the concept of Modification Packs. A Modification Pack (also referred to as Mod or MP) introduces new functions to the Db2 product. For the IBM Db2 Modification Packs and Fix Packs, we mostly use abbreviations such as Db2 11.1 Mod 2 Fix Pack 2, or even shorter, simply Db2 11.1 MP2 FP2.

In 2017, IBM changed its database name from IBM DB2 for Linux, UNIX, and Windows to simply IBM Db2 (with a lowercase 'b' now in Db2). In older SAP publications, you will still find the old product name, but in future documentation, we will use the new term, sometimes extended by 'for Linux, UNIX, and Windows' to avoid confusion with other products of the Db2 family, such as Db2 for z/OS or Db2 for i.

SAP Terminology

- *SAP NetWeaver Application Server ABAP* is referred to as *AS ABAP*.
- *SAP NetWeaver Application Server Java* is referred to as *AS Java*.

Variables

Name of Variable	Description
<SAPSID>	SAP system ID in upper case
<sapsid>	SAP system ID in lower case
<DBSID>	Database name in upper case
<dbsid>	Database name in lower case

Note

The database name is not necessarily the same as the SAP system ID. For example, the database name is not necessarily the same as the SAP system ID in an MCOD (Multiple Components in One Database) environment.

2 Planning

2.1 Upgrade Restrictions

A few restrictions apply if you want to upgrade to Db2 11.1.

Operating System-Related Restrictions

Db2 11.1 is not available for HP-UX, Solaris, and Linux on Power Big Endian. For a list of supported operating systems in an SAP environment, see [Upgrade Requirements \[page 8\]](#).

The use of raw devices for database logging is discontinued in Db2 11.1. You need to change the setting of the database configuration parameter `NEWLOGPATH` to a disk device instead of a raw device.

Database-Related Restrictions



If you are running Db2 for Linux, UNIX, and Windows Version 9.5 or lower, you first have to upgrade the database to Db2 Version 9.7, 10.1, or 10.5 as described in the relevant upgrade guide at <https://help.sap.com/viewer/p/DB6>.

SAP System-Related Restrictions

Db2 11.1 is **not** supported for SAP system releases lower than SAP NetWeaver 7.0. If you have an older SAP release, you must upgrade your SAP system to SAP NetWeaver 7.0 or higher before you can use Db2 11.1.

The procedures described in this guide assume that your SAP system uses the Db2 CLI Driver.

Note

All SAP systems with SAP Basis 7.0 and higher and Db2 9.1 or higher were initially installed with the Db2 CLI Driver. The usage of the Db2 CLI Driver has several important benefits. If your system still uses the Db2 Runtime Client, see SAP Note [1091801](#)  to find out how you can switch to the Db2 CLI Driver. For more information about the Db2 client connectivity setup in an SAP system, see the article *The New Db2 Client Setup in SAP Systems with Db2 for Linux, UNIX, and Windows* at <http://scn.sap.com/docs/DOC-14356> .

More Information

For more information, see *Upgrade restrictions for Db2 servers* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/c0007191.html .

2.2 Upgrade Requirements

When you plan your database upgrade, you have to make sure that requirements regarding the operation system and the SAP system are met and that there is enough space available.

Operating System Requirements

- The upgrade to Db2 11.1 is supported for the following operating systems:
 - Windows on x64
 - AIX
 - Linux on x64

Db2 11.1 is **not** available on HP-UX and Solaris. On Windows, at least Windows Server 2012 is required.

i Note

Make sure that your operating system fulfills all prerequisites for the installation of Db2 11.1. For more information, see *System requirements for IBM Db2 for Linux, UNIX, and Windows* at <http://www-01.ibm.com/support/docview.wss?uid=swg27038033> .

- For **AIX** only: Db2 11.1 uses asynchronous I/O. On AIX, you must install and configure I/O completion ports (IOCP). For more information, see *Configuring IOCP (AIX)* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.admin.perf.doc/doc/t0054518.html .

SAP System-Specific Requirements

i Note

The SAP system-specific requirements for Db2 11.1 are the same as for Db2 10.5. If your system already meets the requirements for Db2 10.5, you have nothing to do.

- Since a specific version of the database shared library (DBSL) `dbdb6s1ib` is required for the SAP kernel, make sure that you have applied the correct SAP kernel patch before you start the database upgrade.

The following table shows the minimum DBSL version that is required:

SAP Kernel Release	DBSL Patch Level
7.21	410
7.22	39
7.45	0

To check the current patch level of your DBSL, proceed as follows:

1. Log on to an application server as user <sapsid>adm.
2. Enter the following command:

```
disp+work -v
```

You can find the DBSL patch information at the end of the output. For more information about how to download and apply the latest SAP kernel patch, see SAP Note [19466](#).

➔ Recommendation

We recommend that you install the latest available SAP kernel patch before you start the Db2 upgrade.

- You must use the following minimum SAP Basis release levels:

SAP Basis Release	SAP Basis Support Package
7.00	SP 27
7.01	SP 12
7.02	SP 12
7.10	SP 15
7.11	SP 10
7.30	SP 8
7.31	SP 5
7.40	SP 2
7.50	SP 0

In addition to the support packages mentioned above, you must implement the following SAP Notes:

SAP Note	Description
1835822	DB6: Compatibility Patches for IBM Db2 10.5 for LUW

- The following SAP tools for Db2 require a specific patch level to be able to work with Db2 11.1:

Tool	Patch Level
dmdb6bkb Note that dmdb6bkb is no longer part of the SAP delivery with kernel 7.40 and higher.	16
brdb6brt	27

For more information about how to download and apply the latest kernel patch for these tools, see SAP Note [19466](#).

Space Requirements

- Before the database upgrade, you have to check the size of the SYSCATSPACE tablespace. If SYSCATSPACE is not enabled for the automatic resize function (AUTORESIZE), you must make sure that at least 50 percent of all pages is free. If AUTORESIZE is enabled or if you are using Db2's automatic storage management (AUTOSTORAGE), you have to check if there is enough free space available in the file systems.
- The upgrade uses the temporary tablespace. In an SAP database, the temporary tablespace is an SMS tablespace with the name PSAPTEMP<pagesize>. The file system in which this tablespace is located **must** allow the temporary tablespace to grow to twice the size that is required by SYSCATSPACE.
- During the upgrade, logs are written. The size of the required log space is related to the size of SYSCATSPACE. To avoid log full situations, make sure that enough log space is available.

➔ Recommendation

As a rough guideline, make sure that your log space is at least as large as SYSCATSPACE.

If you followed the parameter recommendations for the database parameters LOGFILSIZ, LOGPRIMARY, and LOGSECOND as described in the relevant SAP Note for standard parameter settings (see below under *More Information*), the upgrade should run without problems.

In a partitioned database environment, you only need to check the size of the log space on the catalog partition.

To check the available log space, proceed as follows:

1. Log on to the database server as user db2<dbsid>.
2. Connect to the database using the following command:
db2 connect to <DBSID>
3. Check the available log space using the following command:
db2 get snapshot for all databases

The available log space is displayed in the following row of the output:

Log space available to the database (Bytes)

For more information, see *Increasing table space and log file sizes before upgrade* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/t0022269.html.

Other Requirements

- You must perform a backup **before** you start the database upgrade. We recommend that you perform an offline backup. For more information about backup options, see *Backing up databases before or after upgrade* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/t0007139.html .
- For the latest additions and corrections to this document, see **SAP Note 2311008** .

More Information

As for space requirements, see the following SAP Notes with database parameter recommendations:

Db2 11.1: [2303771](#) .

Db2 10.5: [1851832](#) .

Db2 10.1: [1692571](#) .

Db2 V9.7: [1329179](#) .

2.3 Upgrading the Database in Special Environments

This section provides information about upgrading the database in special environments.

Upgrading a Multi-Partition Database

Before you can upgrade a multi-partition database, you have to install the Db2 11.1 software on all database partition servers. The Db2 software can also be provided for all servers using a shared directory.

For more information, see *Upgrading partitioned database environments* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/t0011548.html .

Upgrading the Database in an HADR Environment

In an HADR environment, you can upgrade the primary database and afterwards re-initialize the standby server. If you upgrade a single-partition non-pureScale environment from Db2 10.5 Fix Pack 7 or higher, you have now also the option to upgrade the primary database without the need to re-initialize the standby database. For more information, see *Upgrade Db2 High Availability Disaster Recovery (HADR) environments* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/c0070028.html .

Upgrading the Database in a Microsoft Cluster (MSCS) Environment

To upgrade your database to Db2 11.1 in a Microsoft Cluster environment, you have to install a new copy of Db2 11.1 on all cluster nodes and upgrade the instance and the database manually. For more information, see *Upgrading Db2 servers in Microsoft Cluster Server environments* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/t0022647.html .

Upgrading the Database in an IBM Tivoli System Automation for Multiplatforms (SA MP) Environment

To upgrade a Db2 database that is part of an SA MP cluster, you must first take it out of control of the cluster management software. To do so, set the respective resource groups offline and switch SA MP into manual control mode using the command `samctrl -MT`.


For more information, see *Updating the Database Fix Packs* in the document *IBM Db2 High Availability Solution: IBM Tivoli System Automation for Multiplatforms* at https://help.sap.com/viewer/db6_samp.

3 Upgrading the Database (Linux and UNIX)

Purpose

The following sections describe the required steps for the database upgrade when your operating system is UNIX or Linux.

Caution

You must perform a backup before you start the upgrade. We recommend that you perform an offline backup. For more information about backup options, see *Backing up databases before or after upgrade* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/t0007139.html .

Process Flow

The database upgrade consists of the following steps that you **must** perform in the **specified** order:

1. [Install the Db2 software \[page 13\]](#).
2. [Upgrade the instance and the database \[page 21\]](#).
3. Perform [Post-Upgrade Activities \[page 40\]](#).

3.1 Installation of the Db2 Software

The installation of the Db2 11.1 software consists of the following steps that you **must** perform in the **specified** order:

1. [Installing the Database Software on the Database Server \[page 14\]](#)
2. [Updating the Database Client Software \[page 18\]](#)

3.1.1 Installing the Database Software on the Database Server

Use

The following section describes how you install the database software on the database server for Linux or UNIX operating systems. The Db2 software installation process has changed with Db2 11.1 and now only consists of a few steps.

Caution

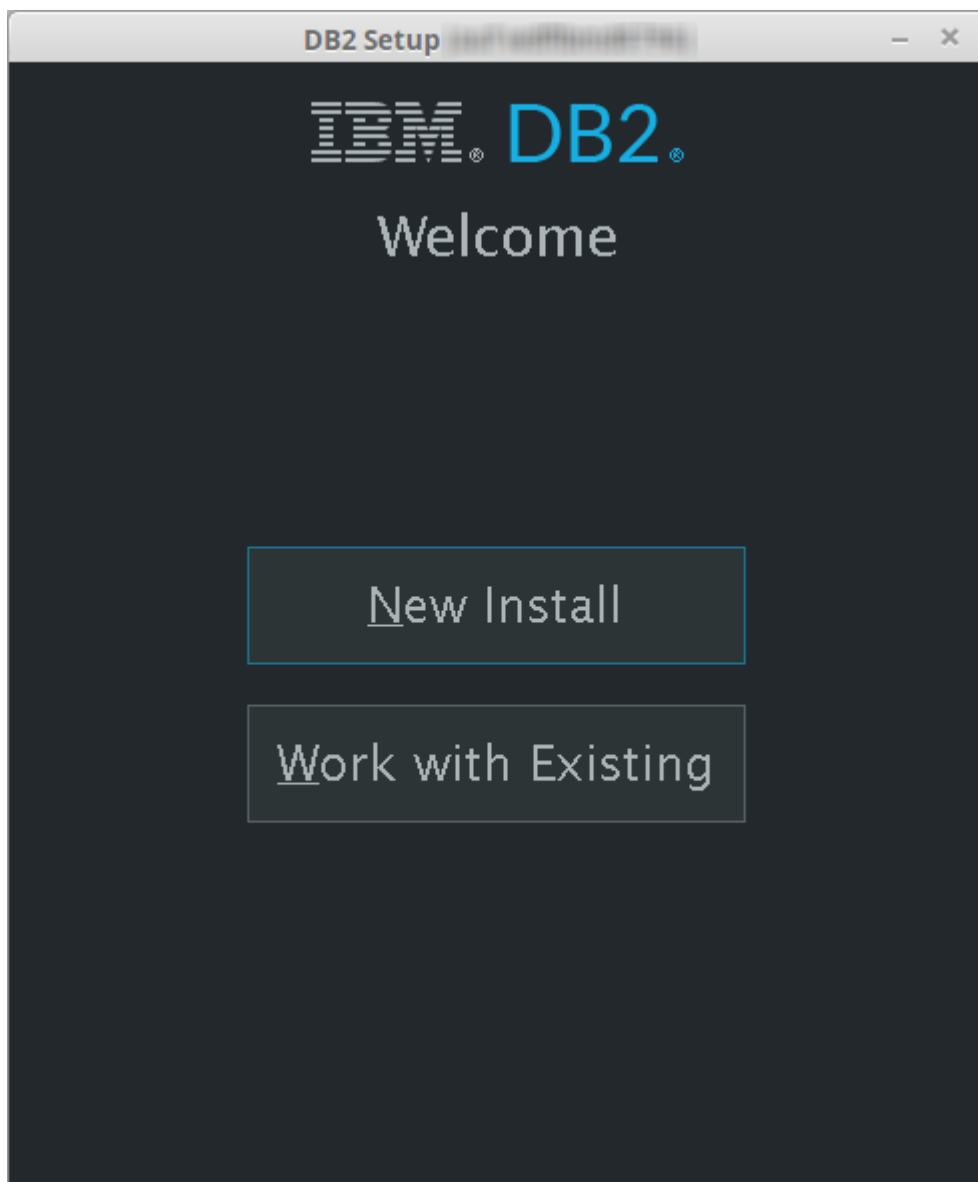
If you are running a partitioned Db2 database system, the Db2 11.1 software must be available in exactly the same directory on all database hosts. Therefore, we recommend that you install the software on a share that is accessible on all database hosts.

Procedure

1. Log on to the database server as user `root` and make sure that you can open programs with a graphical user interface.
2. Insert and mount the database DVD under `<DVD_mount>` and enter the following command, depending on your operating system and processor architecture:

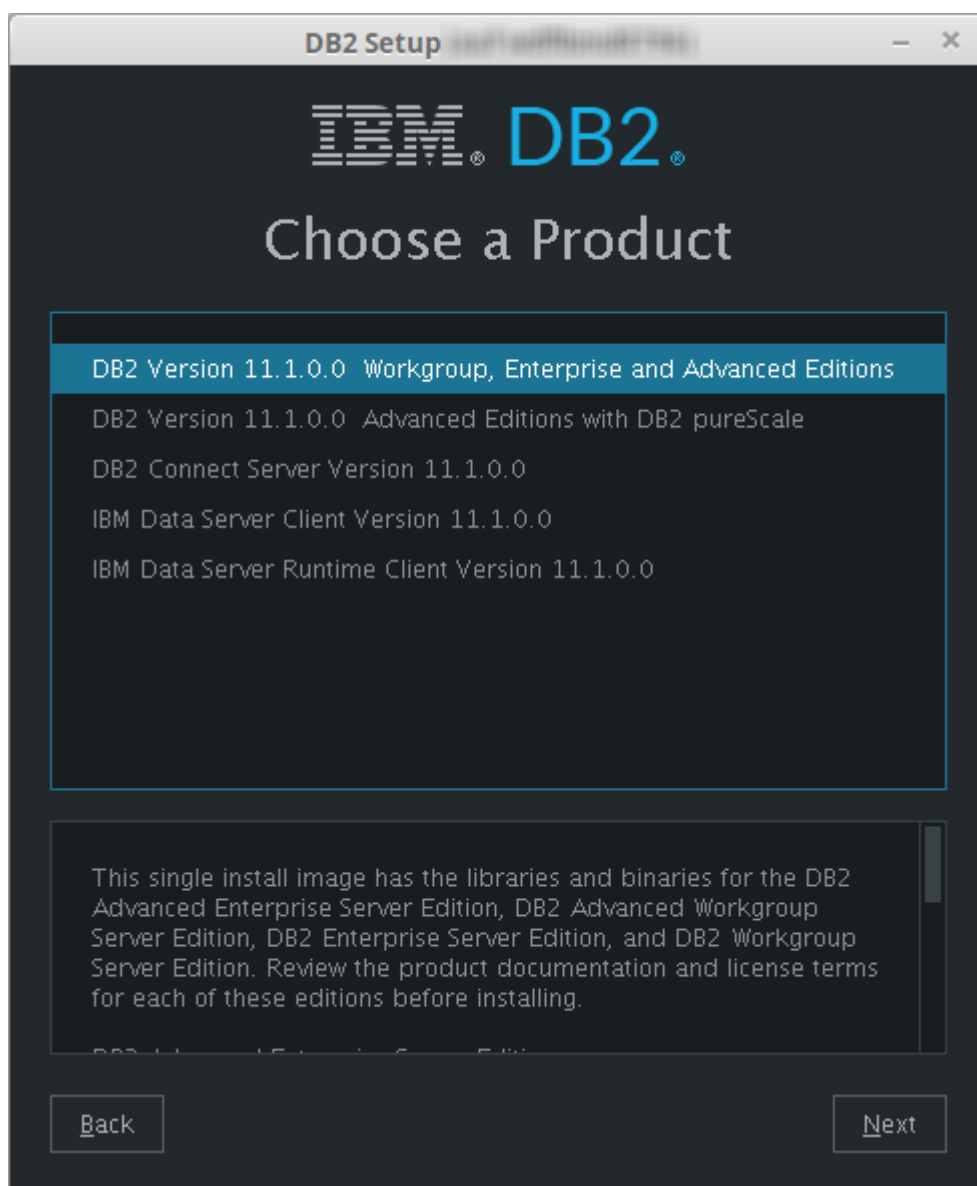
Operating System	Command
AIX	<code>/<DVD_mount>/AIX_64/ESE/disk1/db2setup</code>
Linux x86_64 (AMD64)	<code>/<DVD_mount>/LINUXX86_64/ESE/disk1/db2setup</code>

3. On the [Welcome](#) screen, choose [New Install](#):



Db2 Welcome - New Install

4. On the *Choose a Product* screen, choose *Db2 Version 11.1.xx Workgroup, Enterprise and Advanced Editions*. Then click *Next*:



Choose a Product

i Note

As of Db2 10.5, there is only one install image for the Db2 Workgroup, Enterprise, and Advanced Edition. The applied Db2 license decides which edition will actually be used.

5. On the *Configuration* screen, perform the following actions:
 - Specify the target directory for the Db2 11.1 software installation. Note that on Linux, `ibm` is in lower case.

➔ Recommendation

You should **not** use the default installation paths `/opt/ibm/db2/V11.1` for Linux and `/opt/IBM/db2/V11.1` for AIX. Instead, use a **subdirectory** of the home directory of the instance-owning user such as the following:

```
/db2/ db2<dbsid>/db2_V11.1
```

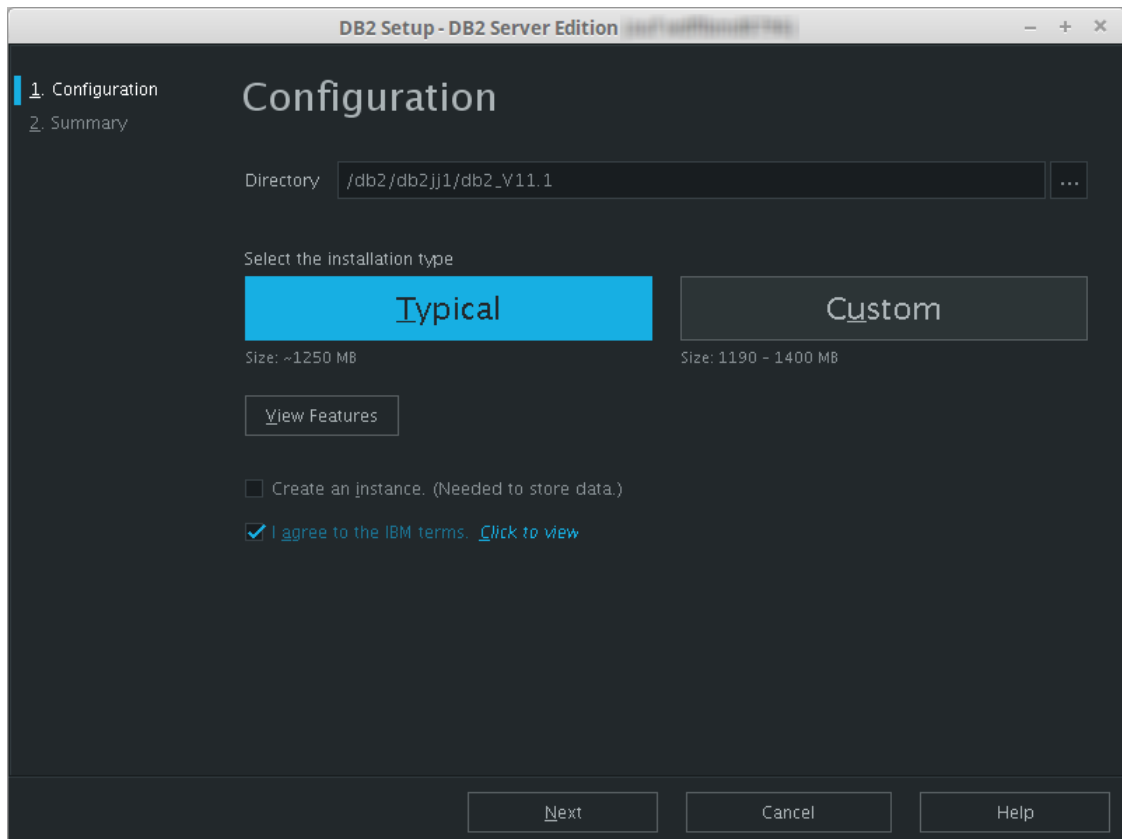
We recommend using such a subdirectory because current versions of the SAP installation tool install a local copy of the Db2 software in a subdirectory of the home directory of the instance-owning user, for example, `/db2/db2<dbsid>/db2_software`. This has the advantage that you can maintain the database software of the Db2 copies independently of each other for each SAP system on the same host.

To check the location of the currently installed Db2 version, log on as user `db2<dbsid>` and enter the **db2level** command.

⚠ Caution

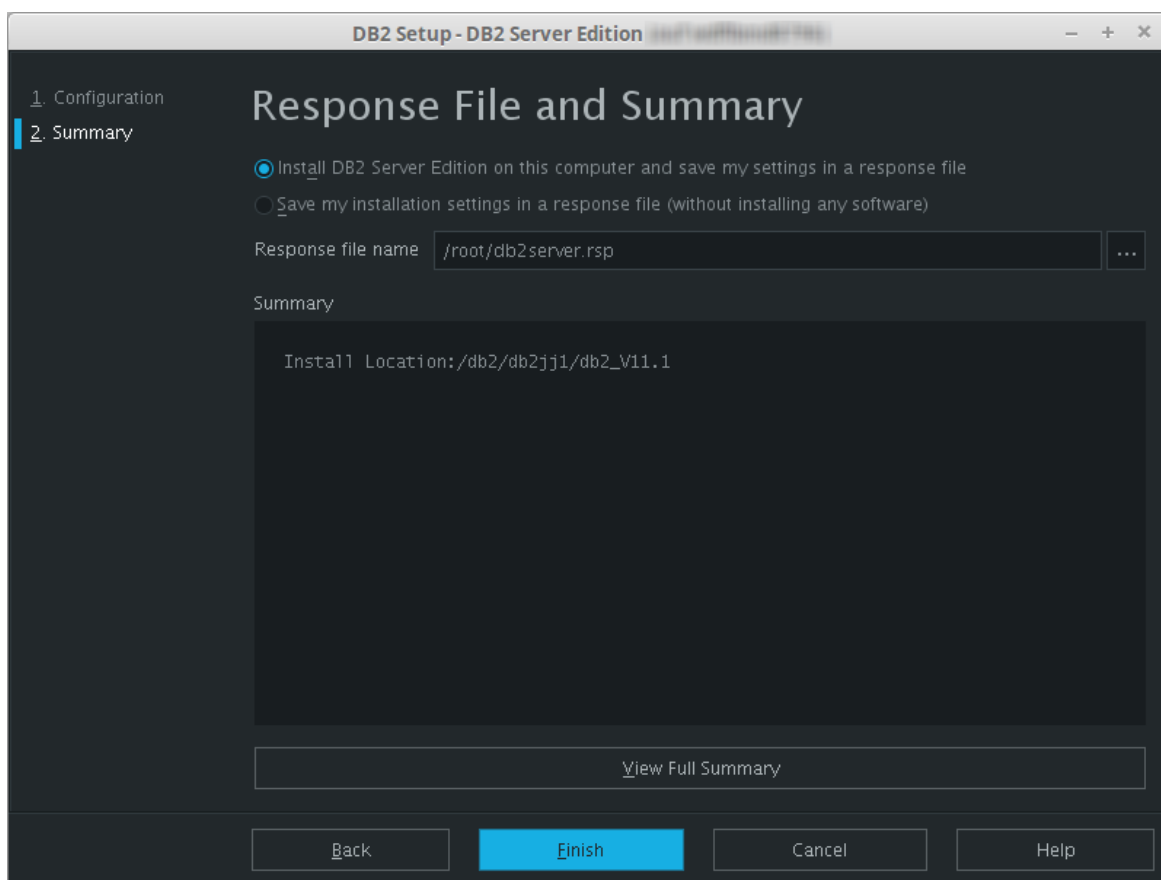
Do **not** install Db2 11.1 in the current instance directory of your Db2 instance `/db2/db2<dbsid>/sqllib` or below.

- Deselect the *Create an instance* checkbox.
- Select the *I agree to the IBM terms* checkbox.
- Click *Next*.



Db2 Configuration Screen

- On the *Response File and Summary* screen, choose *Install Db2 Server Edition on this computer and save my settings in a response file* and click on *View Full Summary*. After you have checked the summary, choose *Finish*:



Response File and Summary

- When the Db2 software installation is finished, review the installation log to make sure the installation was successful.

3.1.2 Updating the Database Client Software

Use

You only have to update the Db2 CLI driver once in the shared directory `/usr/sap/<SAPSID>/SYS/global/db6`.

Each application server can access this directory. Therefore, after the Db2 CLI driver has been updated, it can be used by all application servers.


Procedure

1. Log on to the database host as user <sapsid>adm.
2. Mount the DVD *DB2 V11.1 Client DVD*.
3. Switch to directory <mount_DVD_Dir>/CLIENT.
4. For an **ABAP** or **ABAP+Java** system, start the `db6_update_client.sh` script using the following command:

```
./db6_update_client.sh -u
```


For a **Java-only** system, use the following command to update only the JDBC driver:

```
./db6_update_client.sh -j
```


For more information and the latest version of the `db6_update_client` scripts, see SAP Note [1365982](#)


Result

The new version of the Db2 CLI driver is automatically used after the next SAP system restart, no further action is required.

3.1.2.1 Updating the JDBC Driver in Older SAP Releases

Use

The following section describes how you update the JDBC driver in older SAP releases where it is not located in the shared directory `/usr/sap/<SAPSID>/SYS/global/db6`.

Prerequisites

Since in older SAP releases, the location of the JDBC driver can vary – which means that the appropriate steps to update it can also vary – you should first determine the location of the JDBC driver, which depends on your SAP system release level.

Determining the Location of the JDBC Driver for SAP Releases Lower than SAP Basis 7.10

1. Log on to the respective application server as user <sapsid>adm.
2. Change to the directory `./cluster/bootstrap` of the Java instance using the following command:

```
cd /usr/sap/<SAPSID>/DVEBMGS<instance-no>/j2ee/cluster/bootstrap
```
3. Determine the location of the JDBC driver using the following command:

```
grep driver bootstrap.properties
```


The value of this property of the `rdcms.driverLocation` is returned. It contains the location of the currently used JDBC driver.

Determining the Location of the JDBC Driver for SAP Releases with SAP Basis 7.10 and Higher

1. Log on to the respective application server as user <sapsid>adm.
2. Change to the profile directory of the Java instance using the following command:
`cd /usr/sap/<SAPSID>/SYS/profile`
3. Enter the following command:
`grep dbdriver <instance_profile>`
The path to the JDBC driver is returned.

Procedure

Updating the JDBC Driver in a Central System

The JDBC Driver is part of every database installation. In a central system where all SAP instances are installed on one host, all application servers can use the JDBC driver that is provided by the database system. On all UNIX and Linux platforms, DB2 uses symbolic links to point from the instance directories to the software installation directory.

In a central system, the JDBC driver files should be taken from the following path:

```
/db2/db2<dbsid>/sqllib/java
```

Example

For example, for DB2 V9.7, this link points to the following directory: `/opt/IBM/db2/V9.7/java`

During the database upgrade, this link is automatically updated to the new DB2 software installation directory and therefore the JDBC driver of the new DB2 version is used. However, if `/db2/db2<dbsid>/sqllib/java` is not used to specify the location of the JDBC driver files, the AS Java system still uses the old JDBC driver after a database upgrade. The problem is not immediately obvious because the AS Java system still starts and stops.

However, applications that are using certain new functions that are provided **only** by the new JDBC driver cause errors during execution.

Caution

Due to a problem in the 6.40 version of the SAP installation tool, even if `/db2/db2<dbsid>/sqllib/java` is specified during the installation, the release-dependent directory (for example, `/opt/IBM/db2/V9.7/java` for DB2 Version 9.7) is inserted into the configuration files of the AS Java.

If the wrong path (for example, `/opt/IBM/db2/V9.7/java`) is found in the configuration files of a central AS Java installation, you must manually replace it with the correct path `/db2/db2<dbsid>/sqllib/java` as described in SAP Note [867976](#).

Update the JDBC driver according to one of the following scenarios:

Scenario	Required Action
The JDBC driver is taken from a DB2 server installation. In this case, the directory retrieved using the procedure above is <code>/db2/db2<dbsid>/sqllib/java</code> .	No further action required
The JDBC driver is taken directly from the DB2 software installation directory. In this case, the directory retrieved using the procedure above, for example, for DB2 Version 9.7 is <code>/opt/IBM/db2/V9.7/java</code> .	You have to manually adapt the configuration files of the AS Java system so that the correct driver is taken using the following link: <code>/db2/db2<dbsid>/sqllib/java</code> To do this, follow the instructions in SAP Note 867976 .

Updating the JDBC Driver in a Distributed System

In a distributed SAP system, application servers run on dedicated hosts other than the database host. Therefore, these application servers need their own JDBC driver files. If the JDBC driver is not taken from `.../global/db6`, update the JDBC driver file (`db2jcc.jar` or `db2jcc_license_cu.jar`) manually as follows:

1. Mount the DVD *DB2 V11.1 Client DVD* to directory `<client_dvd_mount>`.
2. As user `<sapsid>adm`, copy the JDBC driver to the destination directory using the following command:
`cp <client_dvd_mount>/CLIENT/jdbc/* <rdbms.driverLocation_dir>`

i Note

If the JDBC driver is not taken from the kernel `exe` directory, which is visible on all servers, you have to repeat this step on all application servers.

3.2 Upgrading the Instance and Database

After the software installation, you have to upgrade the instance and database. Make sure that you perform the following steps in the given order:

1. Back up the Db2 server configuration (recommended).
2. Execute the command `db2support -preupgrade` to collect data for the SAP/IBM support staff.
3. Run program `db2ckupgrade` (optional).
4. Disable all client requests (recommended).
5. Upgrade the instance.
6. Upgrade the Db2 database.
7. Enable client requests (recommended).
8. Verify if the database has been successfully upgraded (optional).
9. Perform a backup (recommended).

Read on for more details about these steps.

Note

In the following procedures, replace <DB2_SWDIR> with your software installation directory for Db2 11.1.

Prerequisites

- You must perform a backup **before** you start the database upgrade. We recommend that you perform an offline backup. For more information about backup options, see *Backing up databases before or after upgrade* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/t0007139.html .
- Make sure that there is enough free disk space available. For more information about space requirements, see the relevant section in [Upgrade Requirements \[page 8\]](#).

Procedure

Backing Up the Db2 Server Configuration (Recommended)

During the upgrade, Db2 configuration parameters are changed automatically. To keep track of the changes, we recommend that you back up the Db2 server configuration before and after the actual upgrade. By comparing the files that contain the Db2 configuration settings after the upgrade has finished, you can review the changes.

Db2 is configured by setting the following:

- Environment variables
- Db2 profile registry variables
- Db2 database manager configuration parameter
- Db2 database configuration parameter

To back up the database configuration, perform the following steps:

1. Log on to the database server as user db2<dbssid>.
2. Create a directory <config_bkp> where you store the configuration using a command such as the following:

```
mkdir /db2/db2<dbssid>/cfg_backup
```
3. Change to the newly created directory <config_bkp> using the following command:

```
cd /db2/db2<dbssid>/cfg_backup
```
4. Back up the database server configuration using the following commands:

```
env > env_before_upg.txt
db2set -all > reg_before_upg.txt
db2 get dbm cfg > dbm_before_upg.txt
db2 get db cfg for <SAPSID> > db_before_upg.txt
```

After the database upgrade, you back up the database configuration again and compare the files that contain the configuration before and after the upgrade. For more information, see [Backing Up the Db2 Server Configuration After the Migration \(Recommended\) \[page 41\]](#).

Collecting Data for SAP/IBM Support Using `db2support -preupgrade`

To help the SAP/IBM support troubleshoot problems that might occur during or after the database upgrade, collect environment and configuration data as follows (only as of Db2 V9.7 Fix Pack 5 or higher):

1. Log on to the database server as `db2<dbsid>`.
2. Execute the command `db2support -preupgrade`. This command stores the collected data in the file `db2support_preupgrade.zip` in the current directory.

Running Program `db2ckupgrade` (Optional)

The `db2ckupgrade` program checks if certain prerequisites for the upgrade are met. This program is automatically called by `db2iupgrade` (see below). If it encounters problems, the upgrade does not start.

You can start `db2ckupgrade` manually before the upgrade.

Note

This is **only** a check and does not affect your database.

Note

In a partitioned database environment, you must run `db2ckupgrade` only on the catalog partition.

1. Log on to the database server as user `<sapsid>adm`.
2. Stop your SAP system and the Db2 instance using the following commands:
`stopsap`
`db2stop force`
3. Log on to the database server as user `db2<dbsid>`.
4. Start the database manager using the following command:
`db2start`
5. Run the `db2ckupgrade` program using the following command:
`<DB2_SWDIR>/instance/db2ckupgrade -e -l /tmp/upgrade.log`
6. Check the file `upgrade.log` for possible errors. If no errors are found, the following message is displayed:
Version of DB2CKUPGRADE being run: VERSION "11.1"
...
DBT5508I The db2ckupgrade utility completed successfully. The database or
databases can be upgraded.

Disabling Client Requests (Recommended)

Connections to your Db2 database are not only made by the SAP system. A central DBA Cockpit installation, the Performance Warehouse or the Monitoring and Alerting Infrastructure within a central Solution Manager system in your SAP system landscape regularly check if connections are possible and retrieve relevant data. After the upgrade of the Db2 instance and before the upgrade of the Db2 database, Db2 accepts only one connection. If in this situation one of the previously mentioned connections is made to the Db2 database, you will not be able to upgrade your database. An attempt to do so results in the following error message:

*SQL1035N The operation failed because the specified database cannot be connected to in the mode requested.
SQLSTATE=57019*

We therefore recommend that you disable all client requests to your Db2 database by performing the following steps:

1. Log on to the database server as user `db2<dbssid>`.
2. Enter the following command:

```
db2set -null DB2COMM
```

After the next restart of the Db2 instance, no communication subsystem is initialized and outside connections to Db2 are not possible. Note that you may see error messages, for example, in the alerting infrastructure that inform you that your database is not available.

Upgrading the Instance

Caution

In a partitioned database environment, upgrade the instance on the database partition server that owns the home directory of the instance owner.

1. Log on to the database server as user `<sapsid>adm`.
2. Stop your SAP system and the Db2 instance using the following commands:

```
stopsap  
db2stop force  
db2 terminate
```

3. Log on to the database server as user `root`.
4. Upgrade the instance using the following command:

```
<DB2_SWDIR>/instance/db2iupgrade -u db2<dbssid> db2<dbssid>
```

Note

To check if all requirements for an upgrade are met, `db2iupgrade` calls the program `db2ckupgrade` in the background. If `db2ckupgrade` finds problems, the Db2 instance is not upgraded. In this case, correct the problem and start `db2iupgrade` again.

If the instance was successfully upgraded, the following message is displayed:

```
Program db2iupgrade completed successfully.
```

The upgrade command saves a backup copy of the instance directory `~db2<dbssid>/sqllib` to one of the following directories:

- `~db2<dbssid>/sqllib_v97`
- `~db2<dbssid>/sqllib_v101`
- `~db2<dbssid>/sqllib_v105`

The files are then adapted in the `~db2<dbssid>/sqllib` directory.

During the instance upgrade, the database manager configuration of Db2 11.1 is merged with the settings of the database manager configuration of Db2 Version 9.7, Db2 Version 10.1, or Db2 Version 10.5.

Upgrading the Db2 Database

Since the Db2 system catalog has been changed with Db2 Version 11.1, you have to upgrade the database.

Caution

In a partitioned database environment, perform the database upgrade on the catalog database partition server.

1. Log on to the database server as user `db2<dbsid>`.
2. Upgrade the database using the following commands:

```
db2start
db2 upgrade database <SAPSID>
```

The time it takes to upgrade the database depends on the size of the system catalog. For a standard SAP NetWeaver 7.0 ABAP only, the upgrade approximately takes 10 to 30 minutes. If the upgrade completes successfully, the following message is displayed:

```
The UPGRADE DATABASE command completed successfully.
```

i Note

If the database upgrade fails, the error message SQL1704N is displayed describing the cause of the failure. For a list of possible solutions for each reason code, enter `db2 "? SQL1704"`.

One of the most common causes of upgrade failure is that there is not enough log file space available. In this case, the following error is returned:

```
SQL1704N Database migration failed. Reason code "3".
```

i Note

If the database upgrade succeeds but additional actions are required, the warning SQL1499W is displayed describing the cause of the failure. In this case, see the Db2 administration log `/db2/<DBSID>/db2dump/db2<dbsid>.nfy` for more information.

Enabling Client Requests (Recommended)

If you disabled client requests to your database as recommended above, you should now enable them again as follows:

1. Log on to the database server as user `db2<dbsid>`.
2. Enter the following command:

```
db2set DB2COMM=
```

The registry variable `DB2COMM` will be reset to its original value *TCPIP* due to the aggregate registry variable `DB2_WORKLOAD` set to *SAP*.
3. Use the following command to check that `DB2COMM` is actually set to *TCPIP*:

```
db2set DB2COMM
```

The value *TCPIP* should be displayed for the registry variable.
4. If the database instance is already running, stop and start it with the following command:

```
db2stop
db2start
```

Verifying the Database Upgrade (Optional)

To verify the success of the database upgrade, you can test if a database activation succeeds by performing the following steps:

1. Log on to the database server as user `db2<dbsid>`.
2. Start the database manager using the following command:

```
db2start
```
3. Activate the database using the following command:

```
db2 activate database <SAPSID>
```

After you activated the database, check the `db2diag.log` in `/db2/<DBSID>/db2dump` for possible problems.

4. Optional: Run the Db2 copy validation tool using the following command:

`db2val`

The Db2 copy validation tool verifies basic functions of a Db2 software installation and generates a report with its findings.

Performing a Backup (Recommended)



Caution

We strongly recommend that you perform a full offline backup of the upgraded database.

4 Upgrading the Database (Windows)

Purpose

The following sections describe the required steps for the database upgrade when your operating system is Windows Server 2012 or higher. Older Windows Server releases are not supported with Db2 11.1.

Caution

You must perform a backup before you start the database upgrade. We recommend that you perform an offline backup.

Process Flow

The database upgrade consists of the following steps that you **must** perform in the **specified** order:

1. [Install the Db2 software \[page 27\]](#).
2. [Upgrade the instance and the database in one step \[page 37\]](#).

Caution

After the database upgrade, you **must** perform a full backup of your database.

3. Perform [Post-Upgrade Activities \[page 40\]](#).

4.1 Installation of the Db2 Software

The installation of the Db2 11.1 software consists of the following steps that you **must** perform in the **specified** order:

- [Installing the Database Software on the Database Server \[page 28\]](#)
- [Updating the Database Client Software \[page 35\]](#)

4.1.1 Installing the Database Software on the Database Server

Use

The following section describes how you install the database software on the database server for Windows operating systems.

Caution

When you install Db2 11.1 on your Windows host, all existing instances of Db2 Version 9.7, Db2 Version 10.1, or Db2 Version 10.5 are automatically upgraded to Db2 11.1. Therefore, you must upgrade all your databases to Db2 11.1 after you have installed the Db2 11.1 software.

Caution

If you are running a partitioned Db2 database system, the Db2 11.1 software must be available in exactly the same directory on all database hosts. Therefore, we recommend that you install the software on a share that is accessible on all database hosts.

Prerequisites

- You must perform a backup before you start the database upgrade. We recommend that you perform an offline backup.
- Make sure that you check all Db2 instances with the `db2ckupgrade` program before installing the Db2 11.1 software as described in *Running Program db2ckupgrade* later in this section.
- Check that there is enough free disk space available. If there is not enough free space available, the upgrade of your Db2 database fails.

You need to check the following:

- System catalog tablespace `SYSCATSPACE`

If `SYSCATSPACE` is not an `AUTOEXTENT` or an `AUTOSTORAGE` tablespace, you must ensure that at least half of the pages is free. To find out the number of used and free pages, use the following command in a Db2 command window:

```
db2 "LIST TABLESPACES SHOW DETAIL"
```

- Temporary tablespaces

SAP systems use SMS-based temporary tablespaces. Make sure that the temporary tablespaces can grow to at least twice the size of `SYSCATSPACE`.

- Log space size

As a rough guideline, make sure that your log space is at least the same size as `SYSCATSPACE`.

If you also followed the parameter recommendations for the database parameters `LOGFILSIZ`, `LOGPRIMARY`, and `LOGSECOND` as described in the relevant SAP Note, the upgrade should run without problems. The SAP Notes for standard parameter settings are as follows:

- Db2 11.1: [2303771](#) 
- Db2 10.5: [1851832](#) 

- Db2 10.1: [1692571](#)
- Db2 V9.7: [1329179](#)

i Note

In a partitioned database environment, you **only** need to check the size of the log space on the catalog partition.

For more information, see *Increasing table space and log file sizes before upgrade* at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/t0022269.html.

Procedure

Backing Up the Db2 Server Configuration (Recommended)

During the upgrade, Db2 configuration parameters are changed automatically. To track the changes, we recommend that you back up the Db2 server configuration before and after the upgrade. By comparing the files that contain the Db2 configuration settings after the database upgrade has finished, you can review the changes.

Db2 is usually configured by setting the following:

- Environment variables
- Db2 profile registry variables
- Db2 database manager configuration
- Db2 database configuration

To back up the Db2 server configuration, proceed as follows:

1. Log on to the database server as user db2<dbssid> and open a Db2 command window.
2. Create a directory <config_bkp> where you store the configuration using a command such as the following:
`mkdir <drive>:\db2\db2<dbssid>\cfg_backup`
3. Change to the newly created directory <config_bkp> using the following command:
`cd <drive>:\db2\db2<dbssid>\cfg_backup`
4. Back up the database server configuration using the following commands:
`set > env_before_upg.txt`
`db2set -all > reg_before_upg.txt`
`db2 get dbm cfg > dbm_before_upg.txt`
`db2 get db cfg for <SAPSID> > db_before_upg.txt`

After the database upgrade, you back up the database configuration again and compare the files that contain the configuration before and after the database upgrade. For more information, see [Backing Up the Db2 Server Configuration After the Upgrade \(Recommended\)](#) [page 41].

Collecting Data for SAP/IBM Support Using `db2support -preupgrade`

To help the SAP/IBM support staff troubleshoot problems that might occur during or after the database upgrade, collect environment and configuration data as follows (only as of Db2 V9.7 Fix Pack 5 or higher):

1. Log on to the database server as db2<dbssid>.

2. Execute the command `db2support -preupgrade`. This command stores the collected data in the file `db2support_preupgrade.zip` in the current directory.

Running Program db2ckupgrade

Before you install the Db2 11.1 software, run the program `db2ckupgrade` to make sure that you can upgrade all instances without problems.

i Note

This is only a check and does not affect any of your databases.

i Note

Run `db2ckupgrade` on your database server for all Db2 instances. In a partitioned database environment, you must run `db2ckupgrade` only on the catalog partition.

1. Stop the SAP system, for example, using the SAP plug-in for the Microsoft Management Console (MMC).
2. Log on to the database server as user `db2<dbssid>` and open a Db2 command window.
3. Stop and restart the database manager using the following commands:
`db2stop force`
`db2start`
4. Change to the following directory:
`cd <CD_drive>\WINDOWS_AMD64\ESE\image\db2\Windows\utilities`
5. Run the `db2ckupgrade` program using the following command:
`db2ckupgrade -e -l <A_WRITABLE_DIRECTORY>\upgrade.log`
<A_WRITABLE_DIRECTORY> can be any directory to which you have write access, for example:
`db2ckupgrade -e -l c:\temp\upgrade.log`
6. Check the file `upgrade.log` for errors. If no errors are found, the following message is displayed:
Version of DB2CKUPGRADE being run: VERSION "11.1".
...
DBT5508I The db2ckupgrade utility completed successfully. The database or databases can be upgraded.

Disabling All Client Requests (Recommended)

Connections to your Db2 database are not only made by the SAP system. A central DBA Cockpit installation, the Performance Warehouse or the Monitoring and Alerting Infrastructure within a central Solution Manager system in your SAP system landscape regularly check if connections are possible and retrieve relevant data. After the upgrade of the Db2 instance and before the upgrade of the Db2 database, Db2 accepts only one connection. If in this situation one of the previously mentioned connections is made to the Db2 database, you will not be able to upgrade your database. An attempt to do so results in the following error message:

SQL1035N The operation failed because the specified database cannot be connected to in the mode requested. SQLSTATE=57019

We therefore recommend that you disable all client requests to your Db2 database by performing the following steps:

1. Log on to the database server as user `db2<dbssid>` and open a Db2 command window.
2. Enter the following command:
`db2set -null DB2COMM`

After the next restart of the Db2 instance, no communication subsystem is initialized and outside connections to Db2 are not possible. Note that you may see error messages, for example, in the alerting infrastructure that inform you that your database is not available.

Installing the Software

1. Log on to the database server as user <sapsid>adm.
2. Stop all your SAP systems and, if they are running, stop the Db2 services.
Determine the software installation directory of the current Db2 instance by using the following command in a Db2 command window:

db2level

Example

The output contains the following line that indicates the installation directory of the Db2 software (<INSTDIR>):

...


Product is installed at "<INSTDIR>"

3. Start the program for installing the Db2 database software using the following command:
<DVD_drive>:\WINDOWS_X86_64\ESE\image\setup
The *Welcome* screen of the *Db2 Setup Launchpad* appears.
4. In the navigation frame of the *Db2 Setup Launchpad*, under *Db2 Version 11.1 Workgroup, Enterprise and Advanced Editions*, choose *Install a Product* and *Work with Existing*.

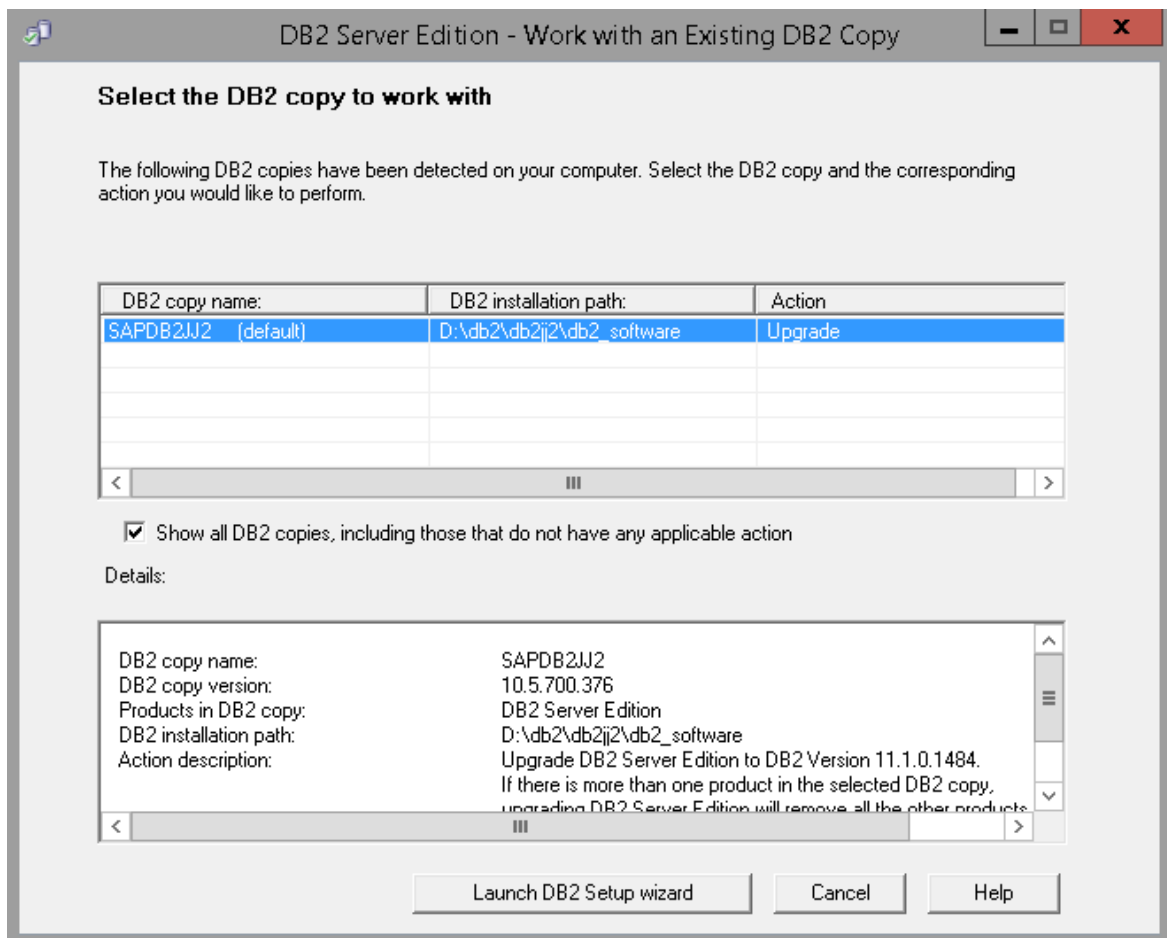
Caution

Do **not** choose *Install New*.

Note

- By choosing *Work with Existing*, you install the software and automatically upgrade all Db2 instances. The existing Db2 software is updated.
- As of Db2 10.5, there is one install image for the Db2 Workgroup, Enterprise and Advanced Edition. The applied Db2 license decides which editions will be actually used.
- In this document, we only describe how to upgrade an existing Db2 copy.
For SAP systems with SAP kernel version 7.00 SR3 and higher, it is technically possible to install a new Db2 copy. However, you have to upgrade the instance to the new copy afterwards. For more information, see *Upgrading Db2 Version 10.5 or Db2 Version 10.1 instances* in the IBM Knowledge Center at http://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.qb.upgrade.doc/doc/t0007196.html .

5. On the screen *Select the Db2 copy to work with*, choose the Db2 copy with the installation path <INSTDIR> (see step 2) and choose *Launch Db2 Setup wizard*.



Work With Existing Db2 Copy - Launch Db2 Setup Wizard

The wizard *Db2 Setup – Db2 Enterprise Server Edition* appears.

⚠ Caution

The exact sequence of the installation steps that follow depends on various factors, for example, your operating system, already installed Db2 components, your installation choices, and the Db2 Fix Pack level.

Therefore, we cannot provide a detailed step-by-step procedure for the Db2 software installation in this document.

The following steps can appear, but not necessarily in the sequence shown below. They outline important points that you have to consider when installing Db2 in an SAP environment:

- If a warning appears that the upgrade will apply changes to your Db2 copy, confirm it and choose *Next*.

i Note

If you receive a warning that Db2 is currently running and locked by some processes, choose *Yes* to shut down these processes.

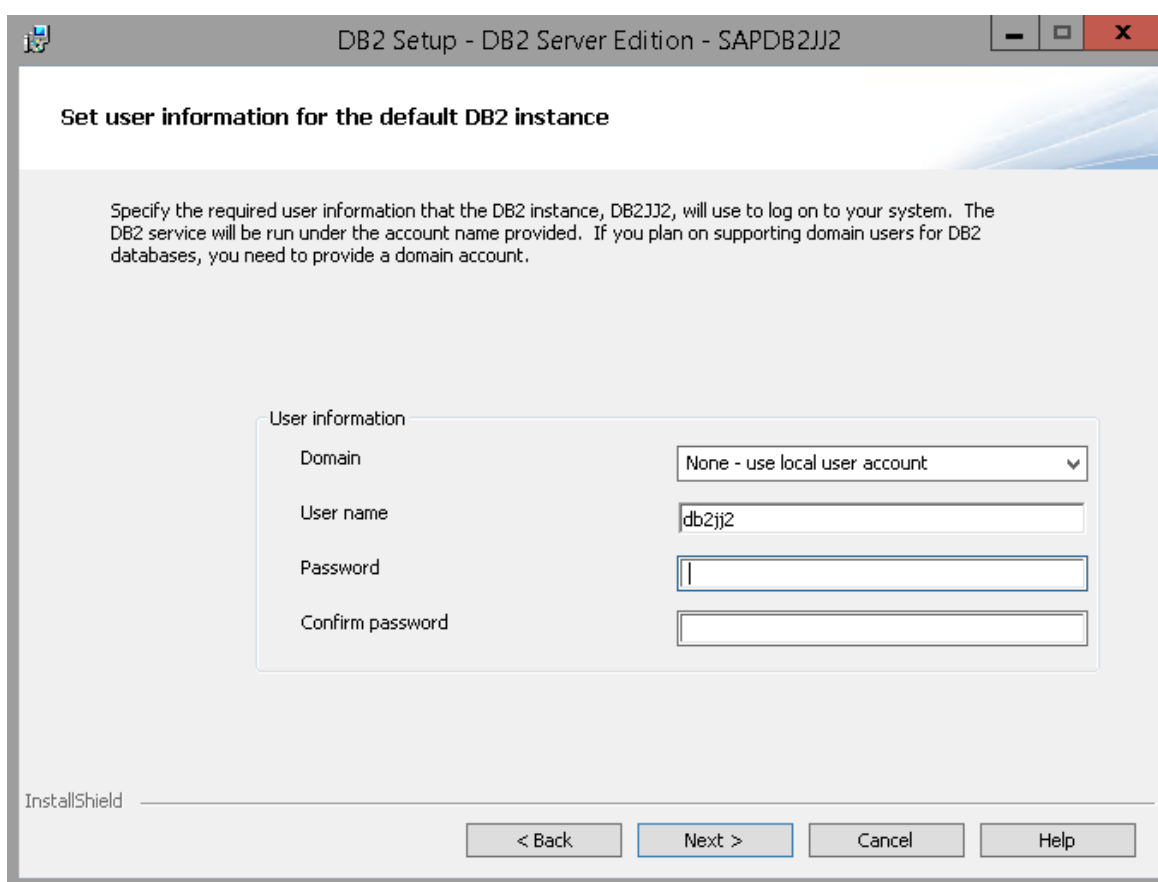
- Accept the license agreement and choose *Next*.

- On the screen *Select the installation type*, choose *Typical* and then *Next*.
- On the screen *Select the installation, response file creation or both*, choose *Install Db2 Server Edition on this computer* and then *Next*.
- On the *Installation folder* screen, confirm the installation directory by choosing *Next*.
- On the *Select the IBM SSH server installation folder and startup option* screen, choose *Do not autostart the SSH server* and then *Next*.

Note

The IBM SSH server is only required by IBM Optim tools.

- On the screen *Set the Db2 copy name*, accept the proposed copy name and then choose *Next*.
- On the screen *Set user information for the default Db2 instance*, enter the password and user name for user db2<dbssid> and then choose *Next*.



Set User Information for the Default Db2 Instance

Note

If db2<dbssid> is a domain user, enter the correct name of the domain. If it is a local user, keep the default setting *None – use local user account*.

Caution

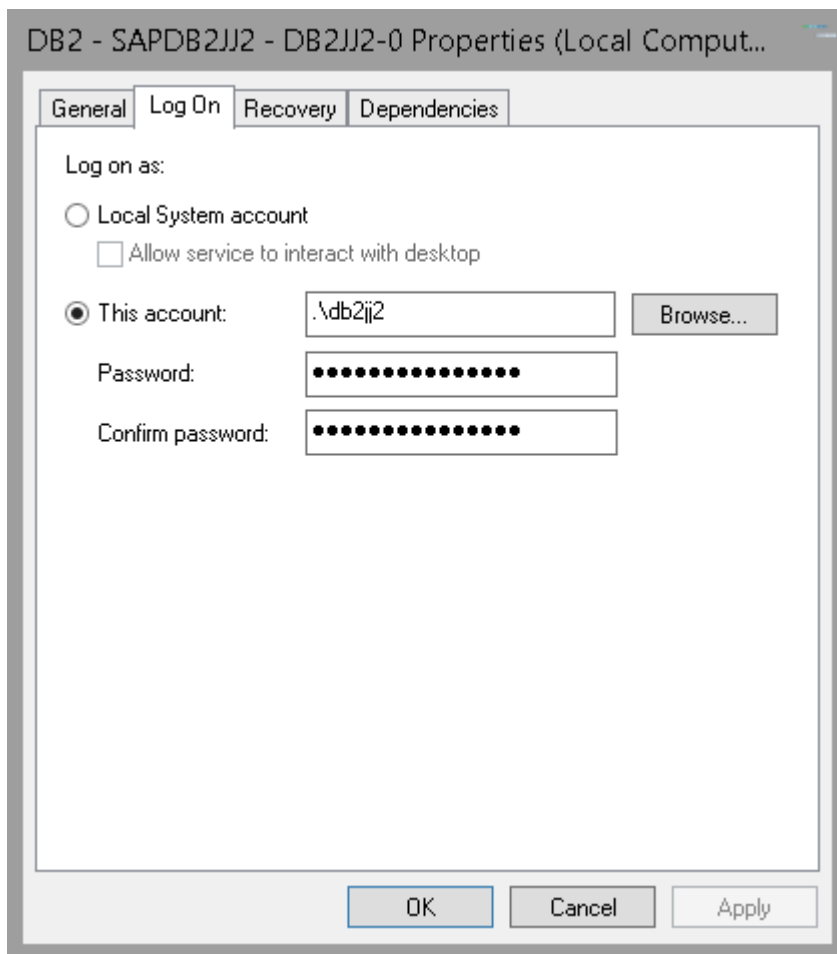
Do not enter the local host name as a domain.

- If the screen *Enable operating system security for Db2 objects* appears, do the following:
 - Select the *Enable operating system security* checkbox.
 - As group name for the Db2 administrators group, enter **DB2ADMNS_<SAPSID>**, and as group name for the Db2 users group enter **DB2USERS_<SAPSID>**. These groups are created by the SAP installation tool by default. If your system was installed with an older version of the SAP installation tool, these two groups may not exist. In this case, use the existing groups DB2ADMNS and DB2USERS (**without** the suffix <SAPSID>).
 - Click *Next*.
- On the *Start copying files* screen, start the installation by choosing *Install*.
- If the installation has successfully finished, the *Setup is Complete* screen appears. To continue, choose *Next*.
- On the *Install additional products* screen, complete the installation by choosing *Finish*. If required, reboot the system.

Checking the Availability of the Db2 Service

Check that the Db2 service is running under user db2<dbsid>:

1. Choose ► *Start* ► *Run* ► or open a command prompt.
2. Enter the following command:
services.msc /s
3. Right-click *DB2<DB2COPY>.<DB2INSTANCE>*.
4. Choose *Properties*.
5. Choose *Log on* and check that this service is running under user db2<dbsid>.



Logon and Checking the Availability of the Db2 Service


4.1.2 Updating the Database Client Software

Use

You only have to update the Db2 CLI driver once in the shared directory `<drive>:\usr\sap<SAPSID>\SYS\global\db6`.

Each application server can access this directory. Therefore, after the Db2 CLI driver has been updated, `<drive>:\usr\sap<SAPSID>\SYS\global\db6` can be used by all application servers.

Procedure

1. Log on to the database server as user <sapsid>adm.
2. Mount the DVD *Db2 V11.1 Client DVD*.
3. Open the Db2 command window and switch to the directory
<drive>:\CLIENT.
4. For an **ABAP** or an **ABAP+Java** system, start the `db6_update_client.bat` script using the following command:
`db6_update_client.bat -u`
For a **Java-only** system, use the following command to update only the JDBC driver:
`db6_update_client.bat -j`
For more information and the newest version of the `db6_update_client` scripts, see SAP Note [1365982](#)
.

Result

The new version of the Db2 CLI driver is automatically used after the next SAP system restart and no further action is required.

4.1.2.1 Updating the JDBC Driver in Older SAP Releases

Use

This section describes how you update the JDBC driver.

Caution

This section only applies to **standalone Java-only** application servers (that is, the application server does not reside on the database host).

If you are upgrading an **ABAP+Java system** or a **Java-only central system** (that is, the application server and the database reside on the same host), you do **not** have to perform any of the steps described in this section.

Prerequisites

On application servers that only contain a Java stack, the location of the JDBC driver can vary, which means that the appropriate steps to update it can also vary. Therefore, you should first determine the location of the JDBC driver, which depends on your SAP system release level.

Determining the Location of the JDBC Driver for SAP Releases Lower than SAP Basis 7.10

1. Log on to the relevant application server as user <sapsid>adm.
2. Open a command prompt and change to the directory `.. \cluster\bootstrap` of the Java instance using the following command:
`cd <drive>:\usr\sap\<DBSID>\>\DVEBMGS<instance-nr>\j2ee\cluster\bootstrap`
3. Determine the location of the JDBC driver using the following command:
`find "driver" bootstrap.properties`
The value of this property of the `rdbms.driverLocation` is returned. It contains the location of the JDBC driver files that are currently used.

Determining the Location of the JDBC Driver for SAP Releases with SAP Basis 7.10 and Higher

1. Log on to the respective application server as user <sapsid>adm.
2. Change to the profile directory of the Java instance using the following command:
`cd <drive>:\usr\sap\<SAPSID>\SYS\profile`
3. Enter the following command:
`find dbdriver <instance_profile>`
The path to the JDBC driver files is returned.

Procedure

Updating the JDBC Driver (If Necessary)

If the JDBC driver is not taken from `... \global\db6`, update the JDBC driver file (`db2jcc.jar` or `db2jcc4.jar`) manually as follows:

1. Mount the DVD *Db2 V11.1 Client DVD* to directory `<drive>:\<client_dvd_mount>`.
2. As user <sapsid>adm, copy the JDBC driver to the destination directory using the following command:
`copy <client_dvd_drive>:\CLIENT\jdbc* <rdbms.driverLocation_dir>`

Caution

If the JDBC driver is not taken from the kernel `exe` directory, which is visible on all servers, you have to repeat this step on all application servers.

4.2 Upgrading the Database

Use

Since the Db2 system catalog has been changed, you have to upgrade the Db2 database. Make sure that you perform all steps in the given sequence:

1. You upgrade the Db2 database.
2. You enable client requests (recommended).
3. You verify if the database has been successfully upgraded (optional).

4. You perform a backup (recommended).

Caution

In a partitioned database environment, perform the database upgrade on the catalog database partition server.

Note

You need to upgrade all Db2 databases that are located on your computer.

Procedure

Upgrading the Db2 Database

1. Log on to the database server as user `db2<dbssid>`.
2. Open a Db2 command window and enter the following commands:

```
db2stop force
db2start
db2 upgrade database <SAPSID>
```

The time it takes to upgrade the database depends on the size of the system catalog. For a standard SAP NetWeaver ABAP 7.0, the database upgrade takes approximately 10 to 30 minutes. If the database upgrade has been completed successfully, the following message is displayed:

```
DB20000I The UPGRADE DATABASE command completed successfully.
```

Note

If the database upgrade fails, the error message `SQL1704N` is displayed describing the cause of the failure. For a list of possible solutions for each reason code, enter `db2 "? SQL1704"`.

One of the most common causes of upgrade failure is that there is not enough log file space available. In this case, the following error is returned:

```
SQL1704N Database migration failed. Reason code "3".
```

Note

If the database upgrade succeeds but additional actions are required, the warning `SQL1499W` is displayed describing the cause of the failure. In this case, see the Db2 administration log messages that are written to the Windows event log for more information.

Enabling Client Requests (Recommended)

If you disabled client requests to your database as recommended in [Installing the Database Software on the Database Server \[page 28\]](#), you should now enable them again as follows:

1. Log on to the database server as user `db2<dbssid>` and open a Db2 command window.
2. Enter the following command:

```
db2set DB2COMM=
```

The registry variable DB2COMM will be reset to its original value *TCPIP* due to the aggregate registry variable DB2_WORKLOAD set to *SAP*.

3. Use the following command to check that DB2COMM is actually set to *TCPIP* :

```
db2set DB2COMM
```

The value *TCPIP* should be displayed for the registry variable.

4. If the database instance is already running, stop and start it with the following commands:

```
db2stop
```

```
db2start
```

Verifying the Database Upgrade (Optional)

To verify the success of the database upgrade, you can test if database activation succeeds by performing the following steps:

1. Log on to the database server as user <sapsid>adm and open a Db2 command window.
2. Start the database manager using the following command:

```
db2start
```

3. Activate the database using the following command:

```
db2 activate database <SAPSID>
```

4. Optional: Run the Db2 copy validation tool using the following command:

```
db2val
```

The Db2 copy validation tool validates basic functions of a Db2 software installation and generates a report with its findings.

5. After you have activated the database, check the db2diag.log in <drive>:\db2\<DBSID>\db2dump for possible problems.

Performing a Backup (Recommended)

We strongly recommend that you perform a full offline backup of the upgraded database.

5 Post-Upgrade Activities

After upgrading the instance and database, perform the following post-upgrade activities:

[Updating the startdb Scripts \(Linux and UNIX Only\) \[page 40\]](#)

[Running the db6_update_db Script \(Mandatory\) \[page 40\]](#)

[Backing Up the Db2 Server Configuration After the Upgrade \(Recommended\) \[page 41\]](#)

[Installing the Db2 License \(Mandatory\) \[page 42\]](#)

[Checking Configuration Settings \(Recommended\) \[page 43\]](#)


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5.1 Updating the startdb Scripts (Linux and UNIX Only)

Use

As part of the start procedure for the application server ABAP and application server Java, the scripts `startdb` and `startj2eedb` are used to start the database manager. SAP systems running on Windows do **not** use these scripts.

For Linux and AIX: If you run into an error when starting the SAP system via `startdb` or `startj2eedb`, you might need to update these scripts. To do so, follow the instructions in SAP Note [1734769](#) .

5.2 Running the db6_update_db Script (Mandatory)

Use

After the upgrade, you must run the `db6_update_db` script to avoid problems. The `db6_update_db` script checks various settings and enables features such as the automatic resize function for the tablespaces. The script also reorganizes the tables of the Db2 system catalog, updates the statistics for these tables, and rebinds all invalid packages.

The following scripts are available on the RDBMS DVD and as attachments to SAP Note [1365982](#):

OS Platform	Script
Linux and UNIX	db6_update_db.sh
Windows	db6_update_db.bat

➔ Recommendation

We recommend that you use the latest version of these scripts attached to SAP Note [1365982](#).

Procedure

Download the latest version of the scripts from SAP Note [1365982](#) and follow the instructions in the SAP Note to run the scripts.

5.3 Backing Up the Db2 Server Configuration After the Upgrade (Recommended)

Use

If you created a backup of the Db2 server configuration before the upgrade, it is useful to create another backup of the configuration after the upgrade.

Procedure

Procedure on Linux and UNIX

1. Log on to the database server as user db2<dbsid>.
2. Change to the previously created configuration backup directory <config_bkp> using the following command:

```
cd /db2/db2<dbsid>/<config_bkp>
```

3. Back up the database server configuration using the following commands:

```
env > env_after_mig.txt
db2set -all > reg_after_mig.txt
db2 get dbm cfg > dbm_after_mig.txt
db2 get db cfg for <SAPSID> > db_after_mig.txt
```

Procedure on Windows

1. Log on to the database server as user `db2<dbsid>` and open a Db2 command window.
2. Change to the previously created configuration backup directory `<config_bkp>`, for example, using the following the command:

```
cd <drive:>\db2\db2<dbsid>\<config_bkp>
```
3. Back up the database server configuration using the following commands:

```
set > env_after_upg.txt
db2set -all > reg_after_upg.txt
db2 get dbm cfg > dbm_after_upg.txt
db2 get db cfg for <SAPSID> > db_after_upg.txt
```

Result


You can now compare the configuration settings before and after the upgrade by comparing the respective `*-before_upg` and `*-after_upg` files using appropriate tools.

5.4 Installing the Db2 License (Mandatory)

Use

After the database upgrade, you have to install the Db2 license.

Procedure

- If you have acquired your Db2 license from SAP (so-called application-specific license or ASL), see SAP Note [816773](#)  to install the license.

Note

For **multi-partition databases**: Install the license on **each** database host.

- If you purchased Db2 directly from IBM, contact your IBM sales representative.

5.5 Checking Configuration Settings (Recommended)

Use

With every Db2 release, the database and database manager configuration changes. Some parameters are dropped, some are added, and the meaning of some parameters is changed. The `db6_update_db` script performs some basic checks after the database upgrade and sets some parameters to recommended values.

Note

A correct configuration is essential for smooth and high-performance operation of the database.

Procedure

Compare the settings for the database and database manager configuration parameters in your upgraded database with the values recommended in SAP Note [2303771](#), which always contains the most up-to-date proposals for these parameters from SAP. In particular, pay attention to the `LOGFILSIZ` and `LOGBUFSZ` database parameters: In Db2 10.1, the size of the log record header has been increased. We recommend that you increase the value of the database configuration parameters `LOGFILSIZ` and `LOGBUFSZ` by 10 to 15 percent if you upgraded from Db2 9.7. You can use the parameter check tool from the DBA Cockpit for this comparison. The tool downloads the recommended parameter settings from SAP Note [2303771](#), compares it to your current configuration, and allows you to correct the settings based on the recommendations from the SAP Note.

More Information

For more information about the parameter changes in Db2 11.1, see *Changed functionality* in the IBM Knowledge Center at https://www.ibm.com/support/knowledgecenter/SSEPGG_11.1.0/com.ibm.db2.luw.wn.doc/doc/c0023232.html.

5.6 Updating Data Extractors in SAP Solution Manager (Optional)

Use

If your database is connected to SAP Solution Manager, you have to update the data extractors for the upgraded database using the setup wizard of SAP Solution Manager.

Note

To monitor Db2 11.1, use SAP Solution Manager 7.1 or higher.

Procedure

1. Log on to your SAP Solution Manager system and call transaction `SOLMAN_SETUP`.
The screen *SAP Solution Manager: Configuration* appears in a separate Web browser.
2. In the navigation frame, choose *Managed Systems Configuration*.
3. On the *Database* tab page, choose the upgraded database and the *Configure Database* pushbutton.
The setup wizard of the SAP Solution Manager system appears.
4. Choose the *Configure Automatically* step.
5. Execute the automatic activity *Database Extractor Setup*.

Result

The setup wizard updates the back end of the DBA Cockpit and reschedules the data extractors for the SAP Solution Manager or the Database Performance Warehouse feature.

5.7 Post-Upgrade Activities for Near-Line Storage (NLS) Systems

Depending on your Db2 version and SAP BW release and support package, BLU Acceleration might be enabled automatically in the NLS database during an upgrade of your Db2 database. However, although BLU Acceleration might be advisable under certain circumstances, it requires that your NLS system meets certain hardware and software requirements.

Depending on your system settings, BLU Acceleration might be enabled automatically for new NLS objects after an installation or upgrade if all of the following applies:

- You have upgraded your NLS database to IBM Db2 10.5 FP1 or higher.
- The relevant SAP BW system runs on one of the following releases and support packages, or has been upgraded to one of the following releases and support packages:

SAP BW Release	Support Package
7.01 (7.0 EHP1)	18
7.02 (7.0 EHP2)	18

SAP BW Release	Support Package
7.30	14
7.31 (7.3 EHP1)	17
7.4	12
7.5	0
7.51	0
7.52	0

If these conditions apply, you need to make an informed decision about using BLU Acceleration.

Follow the instructions of SAP Note [2517998](#) to avoid serious issues with data archiving after the upgrade.

6 References



Are you looking for more documentation? Here's an overview of information sources that are available for SAP systems on IBM Db2 for Linux, UNIX, and Windows.


Documentation by SAP

The following documentation is available on [SAP Help Portal](#) and [SAP Support Portal](#) :


➔ Recommendation

For **central access** to **all** our documentation, use our SAP on IBM Db2 overview page on SAP Help Portal at <https://help.sap.com/viewer/p/DB6>.



Documentation	Where to Find It
System Provisioning: Implementation documentation such as guides for installation, system copy, and SAP system upgrades	https://help.sap.com/viewer/30839dda13b2485889466316ce5b39e9/CURRENT_VERSION/en-US/13e5056ea32d4df38cb5697f9245bf1c.html For example, installation guides for SAP Application Server systems based on SAP NetWeaver: https://help.sap.com/viewer/30839dda13b2485889466316ce5b39e9/CURRENT_VERSION/en-US/c8ed609927fa4e45988200b153ac63d1.html Software Update Manager (SUM) guides: https://support.sap.com/en/tools/software-logistics-tools.html  System copy guides: https://help.sap.com/viewer/30839dda13b2485889466316ce5b39e9/CURRENT_VERSION/en-US/14678bf6e9a04f4f9dc3a1620e96c0b7.html
DBA Cockpit videos and documentation The current version of the document <i>Database Administration Using the DBA Cockpit: IBM Db2 for Linux, UNIX, and Windows</i> provides you with a detailed description of how to perform administrative tasks using the DBA Cockpit.	https://help.sap.com/viewer/db6_dbacockpit (English) https://help.sap.com/viewer/db6_dbacockpit_de (German) Also available in PDF format in English and German . See also our DBA Cockpit videos  .
Current version of the guide <i>SAP Business Warehouse on IBM Db2 for Linux, UNIX, and Windows: Administration Tasks</i>	https://help.sap.com/viewer/db6_bw (PDF here)

Documentation	Where to Find It
Current version of the guide <i>Enabling SAP Business Warehouse Systems to Use IBM Db2 for Linux, UNIX, and Windows as Near-Line Storage (NLS)</i>	https://help.sap.com/viewer/db6_nls (PDF here)
Database upgrade guides	Db2 11.1: https://help.sap.com/viewer/db6_upgrade_11_1 (PDF here) Db2 10.5: https://help.sap.com/viewer/db6_upgrade_10_5 (PDF here) Db2 10.1: https://help.sap.com/viewer/db6_upgrade_10_1 (PDF here) Db2 V9.7: https://help.sap.com/viewer/db6_upgrade_9_7 (PDF here)
Guides on <i>Running an SAP System on IBM Db2 with the Db2 pure-Scale Feature</i>	Db2 10.5: https://help.sap.com/viewer/db6_purescale_10_5 (PDF here) Db2 10.1: https://help.sap.com/viewer/db6_purescale_10_1 (PDF here)
Central access to all SAP Notes	https://support.sap.com/notes 
Central access to all Db2 for LUW-related guides (including the above mentioned)	https://help.sap.com/viewer/p/DB6

SAP on Db2 for Linux, UNIX, and Windows Community

Check out and participate in our SAP community for IBM Db2 at <https://www.sap.com/community/topic/db2-for-linux-unix-and-windows.html> . Here you'll find blogs, Q&As, whitepapers, videos, and guides. You can also post blogs and questions and search the community archive for more.

IBM Knowledge Center

You can find product documentation on your Db2 version in the IBM Knowledge Center at <http://www-01.ibm.com/support/knowledgecenter/SSEPGG/welcome> . For Db2 11.1, IBM also offers PDF manuals at <http://www-01.ibm.com/support/docview.wss?uid=swg27050624> .

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