



Database Upgrade Guide | PUBLIC

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Upgrading to Version 11.5 of IBM Db2 for Linux, UNIX, and Windows

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1 Introduction

Learn how you upgrade your database to version 11.5 of Db2 for Linux, UNIX, and Windows in an SAP system environment if your current database is Db2 10.5 or Db2 11.1 for Linux, UNIX, and Windows.

If your current database version is Db2 10.1 or lower, you first have to upgrade to Db2 version 10.5 as described in the relevant upgrade guide at <https://help.sap.com/viewer/p/DB6>.

i Note

Before you start the database upgrade, read section [Upgrade Restrictions \[page 7\]](#) carefully.

Upgrade Process

To upgrade your database to Db2 version 11.5, you need to perform the following steps in the given order:

1. Plan the upgrade and check the requirements and restrictions.
2. Install the Db2 11.5 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 of this upgrade guide.

For more information, see also [Upgrade to Db2 Version 11.5](#) in the IBM Db2 documentation.

1.1 Document History

⚠ Caution

Before you start the database upgrade, make sure you have the latest version of this document. You can find it at https://help.sap.com/viewer/db6_upgrade_11_5 on SAP Help Portal.

The following table gives you an overview of the most important changes to this upgrade guide:

Version	Date	Description
1.3.4	2023-05-09	Update of SQL statement in section <i>Replacing LONG VARCHAR by LOB Data Types</i> in Upgrade Requirements [page 8]
1.3.3	2023-02-17	Link updates
1.3.2	2023-01-23	Minor corrections SAP on Db2 version 9.7 and 10.1 out of mainstream maintenance
1.3.1	2022-06-14	Small correction (update of example SQL statement)
1.3	2020-08-27	Section Install the Db2 License (Mandatory) [page 42] was updated due to the release of Db2 11.5 MP4 FPOSAP.
1.2	2020-08-14	Small correction in Installing the Database Software on the Database Server [page 28] and Upgrading the Database [page 36]
1.1	2020-02-18	Information about DB2COMM for TCP/IP and SSL was added in Upgrading the Instance and Database [page 21] (Linux and UNIX) and Upgrading the Database [page 36] (Windows). You need to change the Db2 registry variable DB2_EXTENDED_OPTIMIZATION (upgrade from Db2 11.1.4.4 iFix1 SAP only, see Post-Upgrade Activities for BLU Acceleration [page 44]).
1.0	2019-11-05	Initial version

1.2 Naming Conventions

IBM Terminology

The Db2 database versions are referred to as follows:

Database Version	Short Name
IBM Db2 Version 11.5 for Linux, UNIX, and Windows	Db2 11.5
IBM Db2 Version 11.1 for Linux, UNIX, and Windows	Db2 11.1
IBM Db2 Version 10.5 for Linux, UNIX, and Windows	Db2 10.5
IBM Db2 Version 10.1 for Linux, UNIX, and Windows (out of mainstream maintenance)	Db2 10.1
IBM Db2 Version 9.7 for Linux, UNIX, and Windows (out of mainstream maintenance)	Db2 V9.7

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, for example, Db2 11.1 Mod 2 Fix Pack 2, or even shorter, simply Db2 11.1 MP2 FP2.

IBM has 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 more recent documentation, we 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.

Concerning the client connectivity, we refer to the IBM Data Server Driver for CLI also as CLI driver, and to the IBM Data Server Driver for JDBC as JDBC driver.

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

i 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 MCOB (Multiple Components in One Database) environment.

2 Planning

2.1 Upgrade Restrictions

Operating System-Related Restrictions

Db2 11.5 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're running Db2 for Linux, UNIX, and Windows Version 10.1 or lower, you first have to upgrade your database to Db2 Version 10.5 as described in the relevant upgrade guide at <https://help.sap.com/viewer/p/DB6>.

SAP System-Related Restrictions

AS ABAP

Db2 11.5 is **not** supported for AS ABAP systems 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 11.5.

AS Java

Db2 11.5 is **not** supported for AS Java systems lower than SAP NetWeaver 7.5. If you have an older release than SAP NetWeaver 7.5, you must upgrade your SAP system to SAP NetWeaver 7.5 or higher before you can use Db2 11.5.

Client Connectivity

The procedures described in this guide assume that you have the current client connectivity setup where the CLI driver and JDBC driver are located in the directory `usr/sap/sys/global`.

As of SAP Basis 7.0 and higher and Db2 9.1 and higher, SAP systems are initially installed with this connectivity setup. If your system still uses the Db2 Runtime Client, which might be the case if your system was installed on an older Db2 or SAP release, you must convert your client connectivity to the current layout as described in SAP Note [1091801](#).

Related Information

[Upgrade restrictions for Db2 servers](#) in the IBM Db2 documentation

[Upgrade Requirements \[page 8\]](#)

[Upgrading DPF, HADR, MSCS, SA MP, and pureScale Systems \[page 13\]](#)

2.2 Upgrade Requirements

Operating System Requirements

The upgrade to Db2 11.5 is supported for Windows on x64, AIX, and Linux on x64.

Db2 11.5 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 11.5. For more information, see [System requirements for IBM Db2 for Linux, UNIX, and Windows](#) in the IBM Db2 documentation.

For **AIX** only:

Db2 11.5 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 Db2 documentation.

SAP System-Specific Requirements for AS ABAP

i Note

SAP Kernel and DBSL Patch Level

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	1100
7.22	600

SAP Kernel Release	DBSL Patch Level
7.49	500
7.53	200

To check the current patch level of your DBSL, log on to an application server as user <sapsid>adm and enter the following command:

R3trans -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.

SAP BASIS Release Levels

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

SAP Tool Patch Levels

The following SAP tools for Db2 require a specific patch level to be able to work with Db2 11.5:

Tool	Patch Level
dmdb6bkp	16
Note that <code>dmdb6bkp</code> is no longer part of the SAP delivery with kernel 7.40 and higher.	
brdb6brt	36

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

SAP System-Specific Requirements for AS JAVA

Only AS Java release 7.50 (or higher) is supported with Db2 11.5. Older AS Java releases are either out of service or will go out of service soon. As of Db2 11.5, the old JDBC driver `db2jcc.jar`, which is required by older AS Java releases, is no longer supported.

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 Db2 documentation and the following SAP Notes with database parameter recommendations:

Db2 11.5: [2751102](#)

Db2 11.1: [2303771](#)

Db2 10.5: [1851832](#)

Backup Requirements

If you start your upgrade from a database level lower than Db2 10.5 Fix Pack 7 or you have a DPF database, you **must** perform an offline backup before you start the database upgrade. For more information, see [Backing up databases before or after upgrade](#) and [Installation and upgrade enhancements](#) in the IBM Db2 documentation.

ADMIN_MOVE_TABLE Requirements

Make sure you don't have incomplete `ADMIN_MOVE_TABLE` operations on column-organized tables, which would terminate the database upgrade.

The `ADMIN_MOVE_TABLE` stored procedure is used by the `DB6CONV` report to move tables online.

Before the upgrade, run the following SQL statement as Db2 instance owner to find out if there are any open `ADMIN_MOVE_TABLE` operations :

```
SELECT t.tabschema,
       t.tabname
FROM systools.admin_move_table m,
     syscat.tables t
WHERE m.tabschema = t.tabschema
      AND m.tabname = t.tabname
      AND t.tableorg = 'C'
      AND m.key = 'STATUS'
      AND m.value NOT LIKE 'COMPLETE%'
```

If this statement does not return any records or if the table `systools.admin_move_table` does not exist, you can continue with the upgrade procedure.

If the statement returns records, you must complete or cancel the incomplete table move before you continue. If the table move was triggered via `DB6CONV`, you can check and perform the necessary action with `DB6CONV` (see SAP Note [1513862](#)).

If the table move was not triggered via DB6CONV, see the [IBM documentation for the stored procedure ADMIN_MOVE_TABLE](#) in the IBM Db2 documentation on how to perform the necessary actions.

As of Db2 11.1 Mod 1 FP 1, db2ckupgrade also checks if there are any open ADMIN_MOVE_TABLE operations and reports the error.

Replacing LONG VARCHAR by LOB Data Types

Make sure you replace LONG VARCHAR database column types by LOB types **before** you upgrade to Db2 11.5. In previous guides for upgrading to Db2 V9.7 or higher, we used to recommend that you do this replacement in a post-upgrade step. This has changed, the LONG VARCHAR replacement should now be done **before** the upgrade to Db2 11.5.

LONG VARCHAR data types have been deprecated by IBM since Db2 V9.7. SAP databases that were initially installed on Db2 V9.5 or lower may still contain LONG VARCHAR column types in ABAP tables.

With inline LOBs, performance improves and disk space can be saved. Therefore, the type mapping for several ABAP Dictionary types of the AS ABAP was changed to use LOBs instead of LONG VARCHARs as of SAP NetWeaver 7.0 and higher. For more information about type mapping, see SAP Note [29824](#).

The LOB type mapping is automatically used for newly created tables. If your database still contains LONG VARCHAR types for old tables, replace them by LOB data types using the DB6CONV report that is available with SAP Note [1513862](#). To check if your ABAP schema still contains LONG VARCHAR types, use the following SQL statement:

```
SELECT DISTINCT A.TABNAME
FROM SYSCAT.COLUMNS A, SYSCAT.TABLES B
WHERE
A.TABSCHEMA IN (SELECT TABSCHEMA FROM SYSCAT.TABLES WHERE TABNAME = 'SVERS')
AND A.TABSCHEMA = B.TABSCHEMA
AND A.TABNAME = B.TABNAME
AND A.TYPENAME = 'LONG VARCHAR'
AND B.TYPE = 'T'
```

Related Information

[Upgrading DPF, HADR, MSCS, SA MP, and pureScale Systems \[page 13\]](#)

2.3 Upgrading DPF, HADR, MSCS, SA MP, and pureScale Systems

Upgrading a Multi-Partition Database (DPF)

Before you can upgrade a multi-partition database, you have to install the Db2 11.5 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 Db2 documentation.

Upgrading the Database in an HADR Environment

If you upgrade from Db2 10.5 Fix Pack 7 or higher (non-pureScale) or from Db2 10.5 Fix Pack 9 or higher (pureScale), you no longer need to re-initialize the standby database afterwards. Instead, you can keep your HADR setup, upgrade the HADR primary database, and then have the HADR standby database replay the upgrade. This is the recommended procedure as it reduces downtime for the upgrade. Follow the instructions in the [Upgrade Db2 High Availability Disaster Recovery \(HADR\) environments](#) in the IBM Db2 documentation.

If you're upgrading your HADR environment from a Db2 level that doesn't support the new upgrade procedure, or if you don't want to take advantage of the new capability, you can still upgrade the primary database and afterwards re-initialize the standby server as in previous releases.

Upgrading the Database in a Microsoft Cluster (MSCS) Environment

To upgrade your database to Db2 11.5 in a Microsoft Cluster environment, you have to install a new copy of Db2 11.5 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 Db2 documentation.

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](#).

Upgrading a Db2 pureScale System

Db2 pureScale upgrade process:

1. Bring the cluster in maintenance mode.
2. Install the new software copy on one host of the cluster.
3. Upgrade the cluster components.
4. Restart the cluster.
5. Upgrade the Db2 instance and the database.

Before upgrading the Db2 database manager software, the upgrade procedure also renews the cluster components like IBM Spectrum Scale and IBM Tivoli System Automation for Multiplatforms (SA MP). For more information, see [Upgrading a Db2 pureScale server](#) in the IBM Db2 documentation.

After upgrading the cluster components, continue with the instance upgrade as described in this document and also use the information provided in [Upgrading Db2 pureScale Instances](#) in the IBM Db2 documentation.

If the Db2 start release is Db2 10.5.0.4 or higher, you can upgrade the instance on all participating hosts with a single `db2iupgrade` command. If the start release is below that level, the `db2iupgrade` command needs to be executed on all participating servers.

Perform the client upgrade and post-upgrade activities as described in this document here, but install and verify the correct license for IBM Db2 and Tivoli System Automation as described in [Verifying Your License for Db2 and Tivoli System Automation](#) in the [SAP on Db2 pureScale guide](#).

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 Db2 documentation.

Process Flow

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

1. [Install the Db2 software \[page 15\]](#).
2. [Upgrade the instance and the database \[page 21\]](#).
3. Perform [Post-Upgrade Activities \[page 39\]](#).

3.1 Installation of the Db2 Software

The installation of the Db2 11.5 software consists of the following steps that you **must** perform in the **specified** order:

1. [Installing the Database Software on the Database Server \[page 15\]](#)
2. [Updating the Database Client Software \[page 20\]](#)

3.1.1 Installing the Database Software on the Database Server

The following procedure describes the installation steps on Linux and UNIX.

⚠ Caution

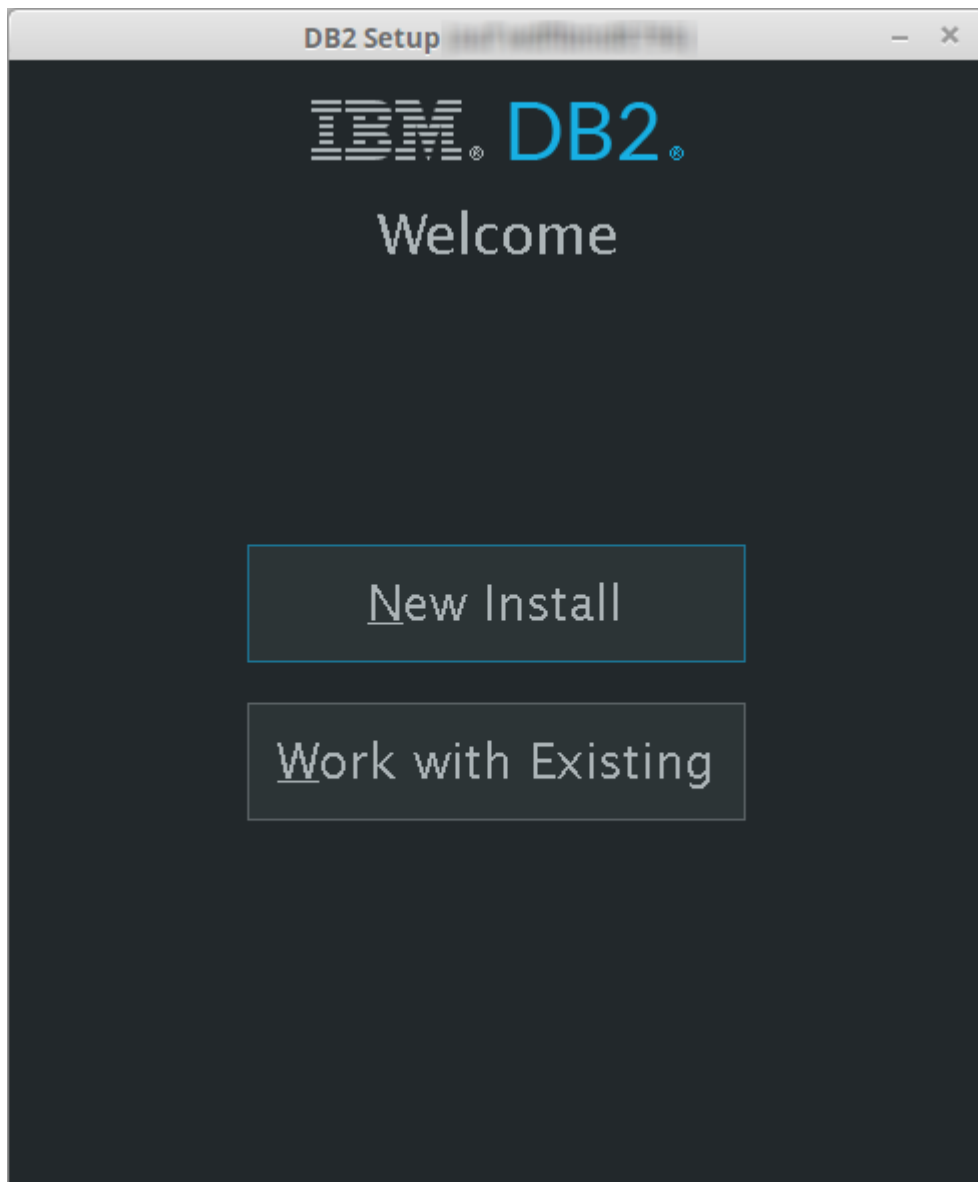
If you're running a partitioned Db2 database system, the Db2 11.5 software must be available in exactly the same directory on all database hosts. Therefore, we recommend that you install the software on a share that is accessible on all database hosts.

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:

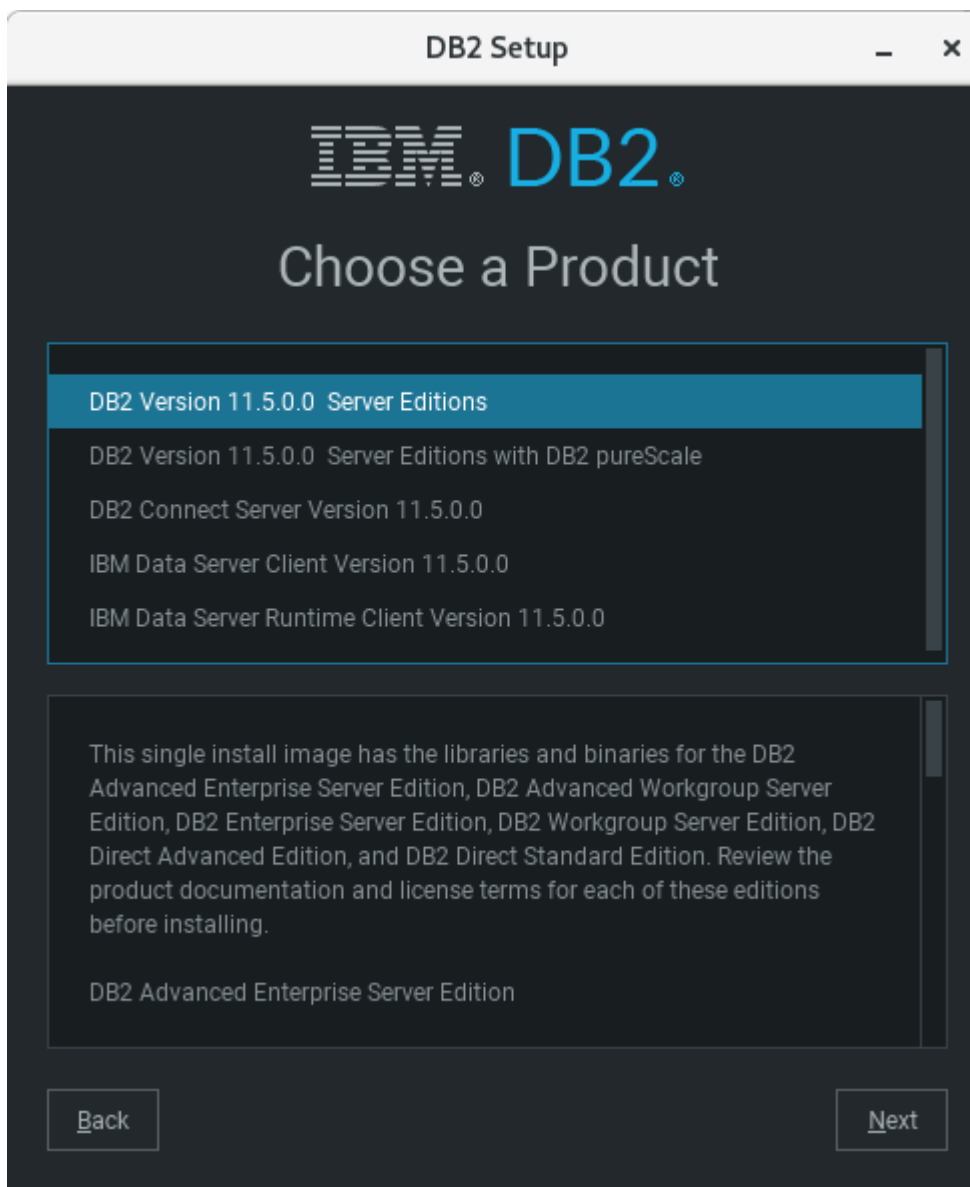
Operating System	Command
AIX	<code>/<DVD_mount>/AIX_64/ESE/disk1/db2setup</code>
Linux x86_64 (AMD64)	<code>/<DVD_mount>/LINUXX86_64/ESE/disk1/db2setup</code>

3. On the *Welcome* screen, choose *New Install*:



Db2 Welcome - New Install

4. On the *Choose a Product* screen, choose *Db2 Version 11.5.x.x Server Editions* and click *Next*:



Choose a Product

Note

There is only one install image for all Db2 Server Editions. 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 11.5 software installation.

→ Recommendation

You should **not** use the default installation paths `/opt/ibm/db2/V11.5` for Linux and `/opt/IBM/db2/V11.5` for AIX (note that on Linux, `ibm` is in lower case). Instead, use a subdirectory of the home directory of the instance-owning user such as `/db2/db2<dbsid>/db2_V11.5`.

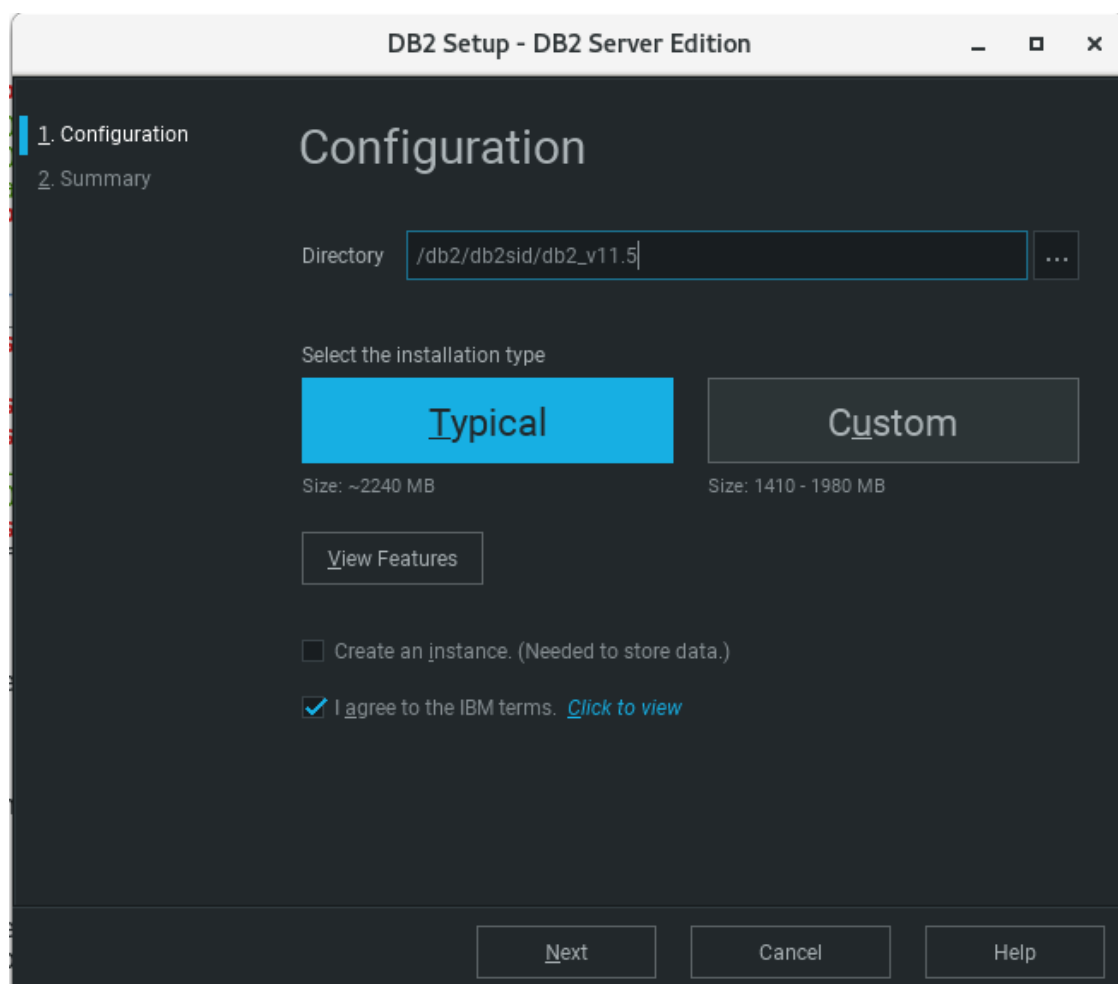
We recommend using such a subdirectory because current versions of the SAP installation tool install a local copy of the Db2 software in a subdirectory of the home directory of the instance-owning user, for example, `/db2/db2<db2sid>/db2_software`. This has the advantage that you can maintain the database 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<db2sid>` and enter the `db2level` command.

⚠ Caution

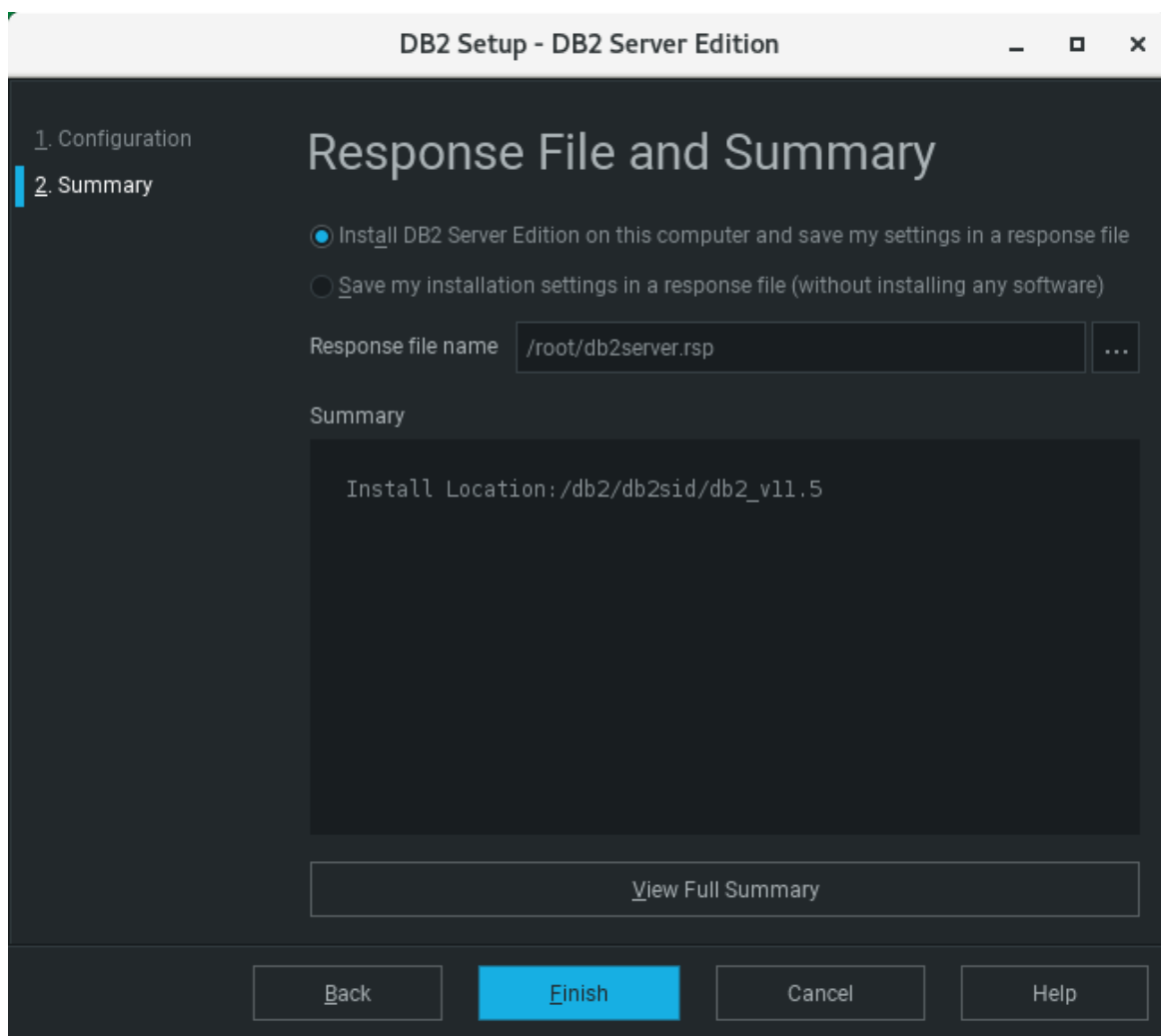
Do **not** install Db2 11.5 in the current instance directory of your Db2 instance `/db2/db2<db2sid>/sql1lib` or below.

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



Db2 Configuration Screen

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



Response File and Summary

7. 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

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 *DB2 V11.5 Client DVD*.
3. Switch to directory <mount_DVD_Dir>/DATA_UNITS/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.

3.2 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** (recommended).
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.

i Note

In the following procedures, replace <DB2_SWDIR> with your software installation directory for Db2 11.5.

Prerequisites

- If you start your upgrade from a database level lower than Db2 10.5 Fix Pack 7 or you have a DPF database, you **must** perform an offline backup before you start the database upgrade. If you start your upgrade from a higher Db2 Fix Pack level and you have a single-member or pureScale database, you can restore a backup from before the upgrade and perform a rollforward recovery through the database upgrade. For more information, see [Backing up databases before or after upgrade](#) in the IBM Db2 documentation.
- 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<dbsid>`.
2. Create a directory `<config_bkp>` where you store the configuration using a command such as the following:

```
mkdir /db2/db2<dbsid>/cfg_backup
```

3. Change to the newly created directory `<config_bkp>` using the following command:

```
cd /db2/db2<dbsid>/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 team troubleshoot problems that might occur during or after the database upgrade, collect environment and configuration data as follows:

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.

If you get the following message, note that it's a warning only and you may ignore it:

```
Error: Failure reading input at "db2os.C:1000". ("/usr/bin/lsdev")
```

```
"4" warnings found during the db2support collection
```

Running Program **db2ckupgrade** (Recommended)

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.

We recommend that you start **db2ckupgrade** manually before the upgrade as follows:

i Note

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

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 "11.5"
...
DBT5508I The db2ckupgrade utility completed successfully. The database or databases can be upgraded.

If **db2ckupgrade** reports back that your Db2 database contains invalid objects (for example, invalid views), you cannot upgrade your database. Instead, do the following:

- You can try to revalidate all invalid objects with the `ADMIN_REVALIDATE_DB_OBJECTS` procedure, for example, as follows:
CALL SYSPROC.ADMIN_REVALIDATE_DB_OBJECTS(NULL, 'SAP<SID>', NULL)
This will revalidate all objects in schema `SAP<SID>`.
- If your database still contains a shadow schema (typically `SAP<SID>SHD`) from an old SAP system upgrade, you can delete all objects in this schema and the schema itself.

⚠ Caution

Make sure that you only delete database objects in a database schema that is no longer needed. Also, make sure that the shadow schema does not belong to a currently running SAP system upgrade. Shadow schemas are created after the "Checks" roadmap step in an SAP system upgrade.

Consider using the `ADMIN_DROP_SCHEMA` procedure to delete a database schema with all its objects.

`db2ckupgrade` also checks if there are any open `ADMIN_MOVE_TABLE` operations that would terminate the upgrade. If so, you must complete or cancel the incomplete table move before you continue. For more information, see *ADMIN_MOVE_TABLE Requirements* in [Upgrade Requirements \[page 8\]](#).

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 remote client requests to your Db2 database by performing the following steps:

1. Log on to the database server as user `db2<dbsid>`.
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<dbsid> db2<dbsid>
```

i 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<dbSID>/sqllib` to one of the following directories:

- `~db2<dbSID>/sqllib_v111`
- `~db2<dbSID>/sqllib_v105`

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

During the instance upgrade, the database manager configuration of Db2 11.5 is merged with the settings of the database manager configuration of Db2 Version 10.5 or Db2 Version 11.1.

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 one of the following commands to reset the DB2COMM registry variable:
 - For systems that use TCP/IP communication:
db2set DB2COMM=

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

- For systems that use SSL communication:

db2set DB2COMM=SSL

3. Use the following command to check that DB2COMM is actually set to the correct value:

db2set DB2COMM

The value *TCPIP* or *SSL* 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)

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 11.5.

⚠ 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 \[page 36\]](#).

⚠ Caution

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

3. Perform [Post-Upgrade Activities \[page 39\]](#).

4.1 Installation of the Db2 Software

The installation of the Db2 11.5 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

⚠ Caution

- When you upgrade a Db2 software copy on your Windows host to Db2 11.5, all existing instances of Db2 version 10.5 and 11.1 under this software copy are automatically upgraded to Db2 11.5. Therefore, you must upgrade all your databases in those Db2 instances to Db2 11.5 after you have installed the Db2 11.5 software. Read on to learn how to upgrade a default Db2 software copy to version 11.5.
- If you're running a partitioned Db2 database system, the Db2 11.5 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

- If you start your upgrade from a database level lower than Db2 10.5 Fix Pack 7 or you have a DPF database, you **must** perform an offline backup before you start the database upgrade. If you start your upgrade from a higher Db2 Fix Pack level and you have a single-member or pureScale database, you can restore a backup from before the upgrade and perform a rollforward recovery through the database upgrade. For more information, see [Backing up databases before or after upgrade](#)  in the IBM Db2 documentation.
- Make sure that you check all Db2 instances with the `db2ckupgrade` program before installing the Db2 11.5 software as described in *Running Program db2ckupgrade* later in this section.
- Check that there is enough free disk space available. If there's not enough free space, the upgrade of your Db2 database will fail.

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 11.5: [2751102](#) 
- Db2 11.1: [2303771](#) 
- Db2 10.5: [1851832](#) 

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](#) in the IBM Db2 documentation.

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<dbsid>` 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<dbsid>\cfg_backup
```

3. Change to the newly created directory `<config_bkp>` using the following command:

```
cd <drive>:\db2\db2<dbsid>\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:

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`

Before you install the Db2 11.5 software, run the program `db2ckupgrade` to make sure that you can upgrade all instances without problems.

Note

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

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 "11.5".
...
DBT5508I The db2ckupgrade utility completed successfully. The database or databases can be upgraded.

If `db2ckupgrade` reports back that your Db2 database contains invalid objects (for example, invalid views), you cannot upgrade your database. Instead, do the following:

- You can try to revalidate all invalid objects with the `ADMIN_REVALIDATE_DB_OBJECTS` procedure, for example, as follows:
CALL SYSPROC.ADMIN_REVALIDATE_DB_OBJECTS(NULL, 'SAP<SID>', NULL)
This will revalidate all objects in schema `SAP<SID>`.
- If your database still contains a shadow schema (typically `SAP<SID>SHD`) from an old SAP system upgrade, you can delete all objects in this schema and the schema itself.

Caution

Make sure that you only delete database objects in a database schema that is no longer needed. Also, make sure that the shadow schema does not belong to a currently running SAP system upgrade. Shadow schemas are created after the "Checks" roadmap step in an SAP system upgrade.

Consider using the `ADMIN_DROP_SCHEMA` procedure to delete a database schema with all its objects. `db2ckupgrade` also checks if there are any open `ADMIN_MOVE_TABLE` operations that would terminate the upgrade. If so, you must complete or cancel the incomplete table move before you continue. For more information, see *ADMIN_MOVE_TABLE Requirements* in [Upgrade Requirements \[page 8\]](#).

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<dbid>` 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 (<INSDIR>):

...

```
Product is installed at "<INSDIR>"
```

3. Start the program for installing the Db2 database software using the following command:
<DVD_drive>:\WINDOWS_AMD64\ESE\image\setup
The *Welcome to Db2 Version 11.5.0.0* screen of the *Db2 Setup Launchpad* appears.
4. In the navigation frame of the *Db2 Setup Launchpad*, choose ► *Install a Product* ► *Work with Existing* ► under *Db2 Version 11.5.0.0 Server Editions*.

⚠ Caution

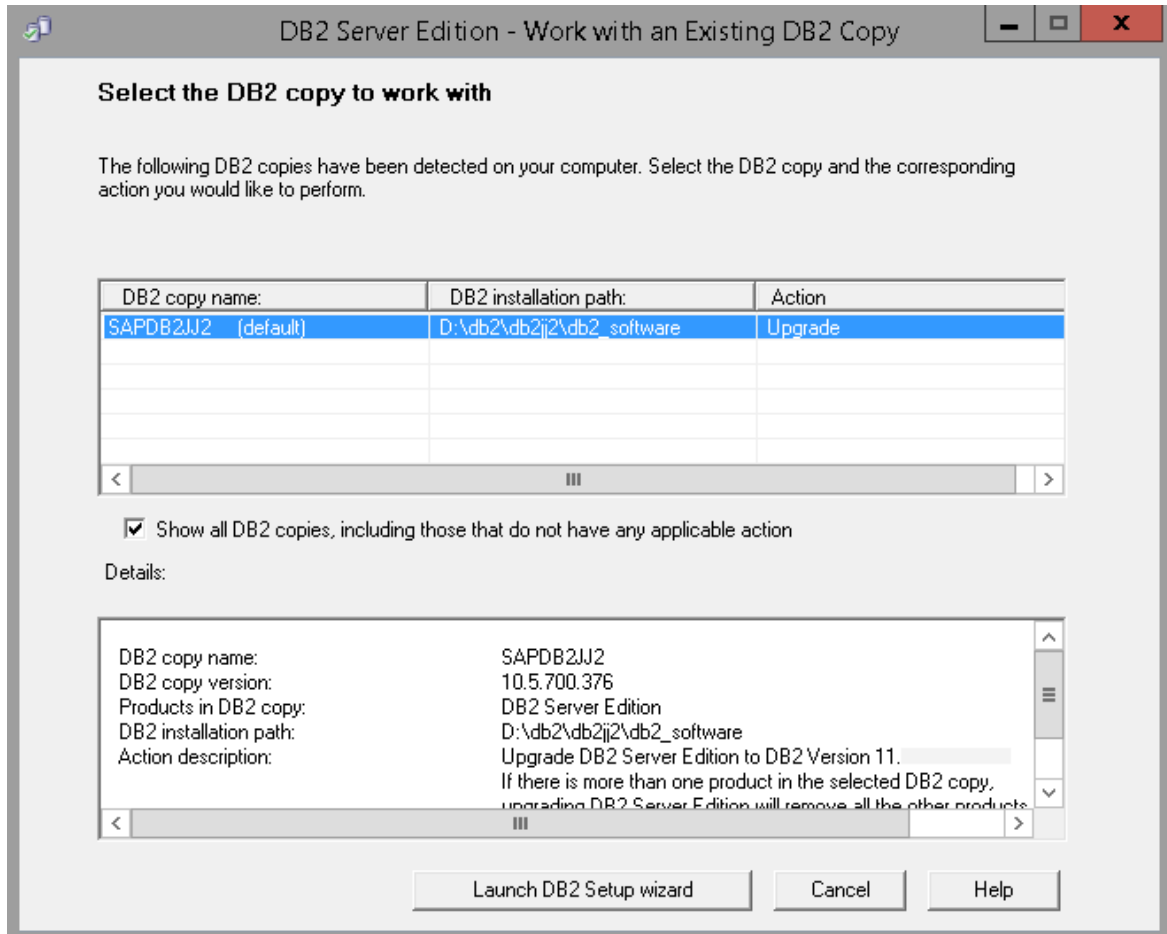
Do **not** choose *Install New*.

i Note

- By choosing *Work with Existing*, you install the software and automatically upgrade all Db2 instances. The existing Db2 software is updated.
- There is one install image for all Server Editions. The applied Db2 license decides which edition 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 11.1 or Db2 Version 10.5 instances](#) in the IBM Db2 documentation.

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](#).

i 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

Specify the required user information that the DB2 instance, DB2JJ2, will use to log on to your system. The DB2 service will be run under the account name provided. If you plan on supporting domain users for DB2 databases, you need to provide a domain account.

User information

Domain	None - use local user account
User name	db2jj2
Password	
Confirm password	

InstallShield

< Back Next > Cancel Help

Set User Information for the Default Db2 Instance

i Note

If `db2<dbsid>` 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

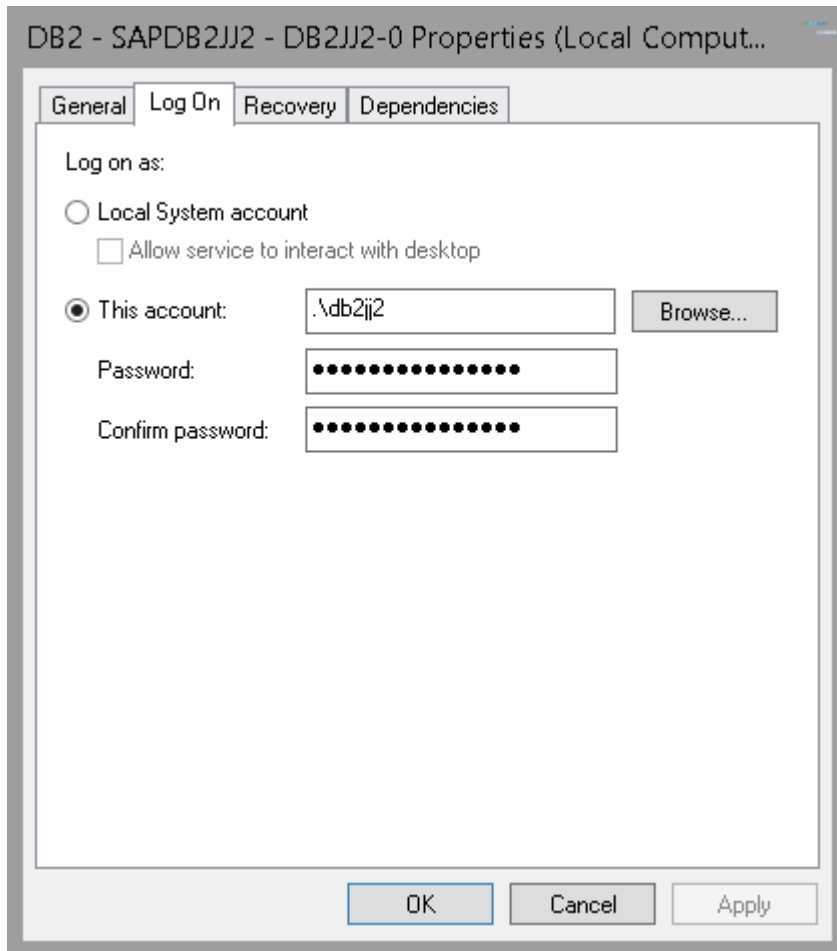
Do not enter the local host name as a domain.

- 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

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 *Db2 11.5 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.

4.2 Upgrading the Database

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. Upgrade the Db2 database.
2. Enable client requests (recommended).
3. Verify that the database has been successfully upgraded (optional).
4. Perform a backup (recommended).

⚠ Caution

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

i 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<dbsid>`.
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.

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 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<dbsid>` and open a Db2 command window.
2. Enter one of the following commands to reset the `DB2COMM` registry variable:
 - For systems that use TCP/IP communication:
db2set DB2COMM=
DB2COMM will be reset to its original value *TCPIP* due to the aggregate registry variable `DB2_WORKLOAD` set to *SAP*.
 - For systems that use SSL communication:
db2set DB2COMM=SSL
3. Use the following command to check that `DB2COMM` is actually set to the correct value:
db2set DB2COMM
The value *TCPIP* or *SSL* 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 `db2<dbsid>` 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:

[Update the startdb Scripts \(Linux and UNIX Only\) \[page 39\]](#)

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

[Take an Offline Backup \(Mandatory\) \[page 40\]](#)

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

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

[Check Configuration Settings \(Recommended\) \[page 42\]](#)

[Update Data Extractors in SAP Solution Manager \(Optional\) \[page 43\]](#)

[Post-Upgrade Activities for Near-Line Storage \(NLS\) Systems \[page 44\]](#)

5.1 Update the startdb Scripts (Linux and UNIX Only)

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](#).

Background:

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.

5.2 Run the db6_update_db Script (Mandatory)

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	<code>db6_update_db.sh</code>
Windows	<code>db6_update_db.bat</code>

→ 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 Take an Offline Backup (Mandatory)

If your Db2 level before the upgrade was lower than Db2 10.5 Fix Pack 7 or if your database is a DPF database, you must take an offline backup of your database before you resume production.

5.4 Back Up the Db2 Server Configuration After the Upgrade (Recommended)

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

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
```

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.

5.5 Install the Db2 License (Mandatory)

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.

i Note

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

- If you purchased Db2 directly from IBM, contact your IBM sales representative to get the license key.

i Note

For upgrades to **Db2 11.5 GA on Windows only**:

If you have a permanent license on Db2 11.1 or 10.5 and then upgrade to 11.5 GA, no license will be applied.

If you do a `db2start` after the software upgrade, you will get the following error:

SQL8000N DB2START processing failed; a valid product license was not found. If you have licensed this product, ensure the license key is properly registered. You can register the license using the `db2licm` command. The license key can be obtained from your licensed product CD.

SQL1032N No start database manager command was issued. SQLSTATE=57019

To solve the problem, install a permanent Db2 11.5 license as described above.

This problem does not exist on AIX/Linux. On these platforms, the Db2 upgrade will install a temporary trial license.

As of **Db2 11.5 MP4 FPOSAP**, this error does **not** occur anymore.

5.6 Check Configuration Settings (Recommended)

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.

i 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 [2751102](#) that always contains the most up-to-date proposals for these parameters from SAP.

More Information

For more information about the parameter changes in Db2 11.5, see [Changed functionality](#) in the IBM Db2 documentation.

5.7 Update Data Extractors in SAP Solution Manager (Optional)

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.

i Note

To monitor Db2 11.5, 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.

5.8 Post-Upgrade Activities for BLU Acceleration

For BLU Acceleration, you might need to change SAP profile parameters or Db2 registry variables after the upgrade.

Removing the SAP Profile Parameter `dbs/db6/deny_cdefield_extension`

Relevant only if you have upgraded from IBM Db2 11.1 GA and lower: As of Db2 11.1 FP1, the following parameter is no longer needed:

```
dbs/db6/deny_cdefield_extension=1
```

The parameter is only needed in SAP systems running with IBM Db2 BLU Acceleration, such as SAP Business Warehouse (see SAP Note [1819734](#)).

This parameter setting prevents operations that extend the length of a VARCHAR column in a column-organized table from running in the SAP system. As of Db2 11.1 MP1 FP1, Db2 can extend the length of a VARCHAR column in a column-organized table. To avoid unnecessary table conversions, remove this parameter in Db2 11.1 MP1 FP1 or higher.

Changing the Db2 Registry Variable `DB2_EXTENDED_OPTIMIZATION` (Upgrade from Db2 11.1.4.4 iFix1 SAP Only)

If you were running an SAP Business Warehouse (SAP BW) system on Db2 with version 11.1.4.4 iFix1 SAP and you have now upgraded to version 11.5 or higher, check the Db2 registry variable `DB2_EXTENDED_OPTIMIZATION`. For the use of parallel insert with Db2 **11.1.4.4 iFix1 SAP only**, it was necessary to change this registry variable. Use the following command to revert it to its default once you have upgraded to a higher Fix Pack or database version:

```
db2set DB2_EXTENDED_OPTIMIZATION=
```

For more information, see SAP Note [2774648](#).

5.9 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
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.

Description	Links
<i>Database Administration Guide for SAP on IBM Db2 for Linux, UNIX, and Windows</i>	https://help.sap.com/viewer/db6_admin
Implementation documentation such as guides for installation, system copy, and SAP system upgrades	Installation guides for SAP Application Server systems based on SAP NetWeaver Software Update Manager (SUM) guides System copy guides
<i>Database Administration Using the DBA Cockpit: IBM Db2 for Linux, UNIX, and Windows</i>	https://help.sap.com/viewer/db6_dbacockpit
<i>SAP Business Warehouse on IBM Db2 for Linux, UNIX, and Windows: Administration Tasks</i>	Db2 10.5 and higher Db2 10.1 and lower (out of mainstream maintenance)
Database upgrade guides	Db2 11.5 Db2 11.1 DB2 10.5 DB2 10.1 (out of mainstream maintenance) DB2 V9.7 (out of mainstream maintenance)
<i>Running an SAP System on IBM Db2 with the Db2 pureScale Feature</i>	Db2 11.5 Db2 11.1 Db2 10.5 Db2 10.1 (out of mainstream maintenance)

Description	Links
<i>Enabling SAP Business Warehouse Systems to Use IBM Db2 for Linux, UNIX, and Windows as Near-Line Storage (NLS)</i>	http://help.sap.com/viewer/db6_nls
<i>IBM Db2 High Availability Solution: IBM Tivoli System Automation for Multiplatforms</i>	https://help.sap.com/viewer/db6_samp
Central access to SAP Notes	Find SAP Notes on SAP Support Portal 
Central access to all Db2 for LUW-related guides (including the above mentioned)	SAP on IBM Db2 overview page

SAP on Db2 for Linux, UNIX, and Windows Community

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Documentation by IBM

For product documentation on your Db2 version, go to the [IBM Db2 documentation](#) .

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