



Standardize IBM DB2 Upgrade Instance and Database Using HP DMA

HP Database and Middleware Automation version 10.30

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Purpose

This paper describes how to use HP Database and Middleware Automation (HP DMA) to create a repeatable, standardized “gold image” for upgrading an IBM DB2 instance and database.

Benefits of HP DMA

HP DMA automates many of the daily administrative tasks required to manage the lifecycle of relational databases and J2EE application servers. These tasks are complex, often manual, typically time-consuming, and frequently error-prone. HP DMA improves the efficiency of these administrative tasks, enabling administrators to deliver change faster with higher quality, better consistency, and improved reliability.

HP DMA equips you to do the following:

- Define and enforce standards for software installation
- Define an installation process once and reuse it repeatedly
- Leverage knowledge enterprise-wide
- Avoid human error

IBM Documentation

For more information about IBM DB2, refer to the following IBM documentation:

DB2 version	IBM documentation
10.1	IBM DB2 10.1
10.5	IBM DB2 10.5

Goal

This workflow upgrades IBM DB2 instance(s) and database(s) on the target server where this workflow is deployed. It currently supports the DB2 versions 9.5, 9.7, 10.1, 10.5 on RedHat Linux and AIX servers. This is a server level workflow. It will install the software and upgrade the existing DB2 Home (also known as the DB2 Installation Directory, for example: /opt/ibm/db2/V10.5) installed on the target machine where this workflow is deployed. It upgrades all instance(s) and database(s) that exist for each of the respective DB2 setup.

The following options are available to upgrade DB2 instance(s) and database(s):

- DB2 9.5 to 9.7
- DB2 9.5 to 10.1
- DB2 9.7 to 10.1
- DB2 9.7 to 10.5
- DB2 10.1 to 10.5

Note: You can create more complex DB2 environments by running multiple deployments of the HP DMA workflows.

Prerequisites

Before performing the procedures in this paper, your environment must meet the following minimum requirements:

- A server running one of the following operating systems (any version that is supported by IBM DB2 and HP DMA):
 - Linux
 - AIX

See the *HP DMA Support Matrix* for specific operating system versions, available at: <http://hpln.hp.com/group/database-and-middleware-automation>.

- Installation media:
 - The DB2 server installation software binary file from IBM.
 - Installation software binary file must be available locally or available for download from the software repository.
- DB2 software must already be installed on the target server.
- Target server has available disk space to unpack the binary file and apply fixpack.
- Unchallenged ability to become the OS administrator user (typically root on UNIX systems).
- The following workflow requirements:

Workflow	Requirements
DB2 - Upgrade Instance and Database	<ul style="list-style-type: none">- The user who runs the workflow with the server wrapper must have access to create or modify the directory structure for instances and databases.- After creating the instances, the license must be activated before the database can use the instance.- The HP DMA database metadata is up-to-date for the DB2 Instance where the workflow is deployed.

Refer to the [IBM Documentation](#) for the following:

- Complete installation and infrastructure requirements for IBM DB2.
- Acceptable types and range of values when using HP DMA advanced parameters to configure IBM DB2 settings.

Process Overview

Upgrading IBM DB2 instance(s) and database(s) on the target server is a simple process. All required checks and steps to upgrade DB2 instance(s) and database(s) have been implemented in a single HP DMA workflow.

Use the following HP DMA workflow to standardize the process of upgrading IBM DB2 instance(s) and database(s) on the target server:

Note: This workflow support DB2 version 10.1 or 10.5 on a Red Hat Linux or AIX server.

Before running the DB2 - Upgrade Instance and Database workflow, the DB2 license must be activated for the instances that you create. For more information, see [Where can I learn more about IBM DB2 licenses?](#)

Important Notes: The DB2 - Upgrade Instance and Database workflow does not support the following:

- The DB2 - Upgrade Instance and Database workflow currently installs only the GA or fixpack and upgrades all the instance (s) and database(s) against the specific DB2 Installation. It does not currently upgrade a specific instance or database.
- The DB2 - Upgrade Instance and Database workflow currently does not upgrade the instance(s) and databases(s) that are provisioned on DB2 High Availability Disaster Recovery (HARD), DB2 Purescale, or Database Partition Feature (DPF).
- This workflow currently does not support cleaning up the partially upgraded instance(s) or database(s). Partially upgraded database(s) or instance(s) cannot be restored or downgraded to its original state. In such cases, install the fresh DB2 binary (with the necessary versions on DB2), provision the instance(s) desired, and restore the database(s) from backup.
- This workflow does not upgrade DB2 Admin Server. DB2 Admin Server has to be manually upgraded.

Workflow: DB2 - Upgrade Instance and Database

This section provides detailed information required to run the DB2 - Upgrade Instance and Database workflow.

Solution pack

This workflow requires the HP DMA Database Provisioning Solution Pack.

Parameters to expose

If user desire to use non-default values set in the workflow step, the following parameters are exposed for user input:

- Clean on Failure
- Clean on Success
- DB2 Archive Location
- DB2 Configuration Backup Location
- DB2 Installation Type
- DB2 Product Edition
- DB2 Product Installation Language
- DB2 Product License
- DB2 Staging Location
- DB2 Upgrade Check Logfile Location
- Install Tivoli System Automation Multiplatforms
- Trust SSL Certificates
- User Defined Responsefile
- Web Service Password
- Web Service URL
- Web Service User

Input parameters

When you deploy the DB2 - Upgrade Instance and Database workflow, specify input parameter values for the following steps.

Note: Bold text in the following tables indicates that you must specify a value for the parameter.

Step: Gather Parameters for DB2 Upgrade Instance and Database

Parameter	Description	Example Value
DB2 Existing Installation Location	The fully-qualified absolute directory path where the current version of DB2 software is already installed and set up with instances and databases.	/opt/ibm/db2/v10.1
DB2 Installation Location	The fully-qualified absolute directory path where the upgrade version of DB2 software will be installed to upgrade the instances and databases.	/opt/ibm/db2/v10.1_to_v10.5
DB2 Software Binaries	Required: Name of the DB2 installer archive file. Obtained from IBM. If the file is not found in DB2 Archive Location (/tmp/dma/archive), It will be downloaded from the SA repository.	v10.5_aix64_server_t.tar.gz

Step: Gather Advanced Parameters for DB2 Upgrade Instance and Database

Parameter	Description	Example Value
Clean on Failure	Optional: Flag that determines whether to clean up on workflow failure. If set to 'yes', the workflow will clean up the downloaded files, installation location and the staging location. Valid values are 'Yes' and 'No'. The default value is 'Yes'.	Yes
Clean on Success	Optional: Flag that determines whether to clean up on workflow success. If set to 'yes', the workflow will clean up the downloaded files. The default value is 'Yes'.	Yes
DB2 Archive Location	Optional: Location on the target machine where the DB2 binaries will be stored prior to the installation. The default value is /tmp/dma/archive.	/tmp/dma/archive
DB2 Configuration Backup Location	Optional: Directory location where the DB2 Server, instance and database level configuration will be backed up in different files. The default value is set '/tmp/dma/config_bkp'.	/tmp/dma/config_bkp
DB2 Installation Type	Optional: The type of DB2 installation supported by IBM. It can be either COMPACT, TYPICAL or CUSTOM. The default value is 'TYPICAL'. If set the CUSTOM, you should provide the DB2 installation responsefile with the custom parameter values.	TYPICAL
DB2 Product Edition	Optional: The product that you want to install, for example, DB2 Workgroup Edition, DB2 Enterprise Edition only, or other editions. The default value is set to 'DB2_SERVER_EDITION' for DB2 10.5 in this step. If upgrading to DB2 version 9.7 or 10.1 then you should use 'ENTERPRISE_SERVER_EDITION'.	DB2_SERVER_EDITION
DB2 Product Installation Language	Optional: The language(s) you want installed. If you do not enable any language keywords, then the English language (EN) will be installed by default. Please refer IBM install guide for the more details.	EN
DB2 Product License	Optional: Modify the value of the following LIC_AGREEMENT keyword to indicate that you have read and agreed to the license agreement file in the db2/license directory on the installation media. Default value is set to 'ACCEPT'	ACCEPT
DB2 Staging Location	Optional: Location on the target machine where the DB2 software installation binaries will be extracted. The default value is /tmp/dma/staging.	/tmp/software/staging
DB2 Upgrade Check Logfile Location	Optional: Directory location on target machine where the pre-upgrade check logfile will be created if it runs. The default location value is '/tmp'. The only valid values are /tmp or /var/tmp.	/tmp

Step: Gather Advanced Parameters for DB2 Upgrade Instance and Database, continued

Parameter	Description	Example Value
Install Tivoli System Automation Multiplatforms	Optional: If set to "YES", IBM Tivoli System Automation for Multiplatforms (SA MP) is installed with required components. Do not specify any value if installing DB2 10.1 (or higher version) since this option is deprecated.	NO
Trust SSL Certificates	Optional: If 'True', this step will trust any SSL used to connect to the DMA Web Service.	True
User Defined Responsefile	Optional: The user response file that will be used to provision DB2 Software. If the user response file is not specified, the workflow will use the deployment parameters and create a default response file using the default configuration set. If responsefile is provided, workflow will use the user specified responsefile parameter values.	
Web Service Password	Optional: Password for the HP DMA Discovery web service API to discover and update the metadata in DMA.	--
Web Service URL	Optional: URL for the HP DMA Discovery web service API to discover and update metadata in DMA.	--
Web Service User	Optional: User for the HP DMA Discovery web service API to discover and update metadata in DMA.	--

FAQs

Can I upgrade the current DB2 on specific universal fixpack?

No. Currently the DB2 - Upgrade Instance and Database workflow does not support universal fixpack.

Can I use DB2 - Upgrade Instance and Database workflow to upgrade fixpack?

Yes. The workflow supports upgrading lower version of DB2 fixpack to a higher version of DB2 fixpack level (for example, from 10.1 FP4 to 10.5 FP6).

Where can I learn more about IBM DB2 licenses?

For more information about IBM DB2 licenses, refer to the following IBM documentation:

DB2 version	IBM license information
9.5	IBM DB2 9.5 license files
9.7	IBM DB2 9.7 license files
10.1	IBM DB2 10.1 license files
10.5	IBM DB2 10.5 license files

HP DMA does not automatically provision the IBM DB2 license.

Appendix A: How to meet prerequisites

This appendix provides instructions that you can use to fulfill the general requirements to provision IBM DB2 10.5 on either a Red Hat Enterprise Linux server or an AIX server.

Note: Adapt these instructions as appropriate for other IBM DB2 versions.

DB2 10.5 on Red Hat Enterprise Linux Server

1. Install (or update) the OS packages:

```
yum libpam.so.0  
yum libaio.so.1  
yum libstdc++.so.6.0.8  
yum install pdksh
```
2. Set the kernel parameters as recommended by IBM:
 - a. Edit the file `/etc/sysctl.conf`
 - b. Set the parameter values as shown:

```
vm.swappiness=0  
vm.overcommit_memory=0
```
3. Set and automate the kernel settings:

```
/sbin/sysctl -p
```

DB2 10.5 on AIX Server

Install the I/O Completion Ports (IOCP):

1. Run the command:

```
#smitty iocp
```
2. Select the Change/Show characteristics of the I/O Completion Ports.
3. Change the status of IOCP from **defined** to **available**.
4. Reboot the AIX server.
5. Verify the IOCP status.

Appendix B: Alternative methods for specifying input files

HP DMA provides alternative methods for specifying input files, either downloaded from the software repository or stored directly on the target server(s).

Method 1: The input files are in the software repository

1. Obtain the pertinent input files.
For example, download the DB2 installer archive file from IBM.
2. Import the files into the software repository. For additional information, see ["How to import a file into the software repository"](#).
3. When you create the workflow deployment, specify the filenames and/or directory names for the pertinent input parameters—the files should not exist on the target server(s).
4. When the deployment is executed, HP DMA determines that the input files do not exist on the target server(s) in the specified (or default) download location and then downloads them from the software repository. If the input files need to be processed (for example, unzipped), the new files are placed in the specified (or default) extract location.
5. All downloaded, extracted, and staged files are removed upon successful completion of the workflow.

Method 2: The input files are stored on each target server

1. Obtain the pertinent input files.
For example, download the DB2 installer archive file from IBM.
2. Copy the files to each target server into the specified (or default) download location.
3. When you create the workflow deployment, specify the filenames and/or directory names for the pertinent input parameters.
4. When the deployment is executed, HP DMA determines that the input files exist on the target server(s) in the specified (or default) download location. If the input file needs to be processed (for example, unzipped), the new files are placed in the specified (or default) extract location.
5. All extracted and staged files (and any downloaded files) are removed upon successful completion of the workflow.

To learn more about HP Database and Middleware Automation visit

hp.com/go/dma

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May 2015

