

Exploiting DB2 9 for z/OS Features: Partition-by-Growth with Universal Table Spaces



Applies to:

This article applies to all SAP products based on SAP NetWeaver 7.0 application server ABAP. This includes Enhancement Package 1 for SAP NetWeaver 7.0 and all future Enhancement Packages. The status of partition-by-growth table space feature exploitation for other SAP releases is documented as well.

Summary

This document is of interest to you if you want to exploit the DB2 specific feature partition-by-growth that comes with the universal table space on DB2 Version 9.

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1 Introduction

IBM introduced various new features with DB2 9 for z/OS. Universal table spaces and partition-by-growth in particular are designed for large tables with more than 64 GB storage, but without the need to define partition ranges. At the same time, these tablespaces internally take advantage of a segmented structure, which benefits INSERT and DELETE performance for example.

This article is intended to document the needed steps if you plan to use partition-by-growth table spaces with SAP. All necessary steps are part of an SAP system installation, an R3load based system copy or a Unicode migration. Upgrades and the selection of specific tables with the SAP Dictionary are documented as well.

2 Documentation

2.i IBM Documentation

For further information about universal table spaces and DB2 9 for z/OS, see

http://publib.boulder.ibm.com/infocenter/dzichelp/v2r2/index.jsp?topic=/com.ibm.db29.doc.sqlref/db2z_sqlref.htm

There you can search for the following terms:

- [Introduction - Universal table spaces](#)
- [What's new - Universal table spaces](#)
- [Partition-by-growth table spaces](#)

2.ii SAP Documentation

Phrases and wording used in this article are described in SAP documentation regarding SAP system installations or SAP system copies. For more information on these topics, see the corresponding guides:

- System Copy for Systems Based on <your SAP system version and technology>
at <http://service.sap.com/instguides> → <your SAP system version> → *Installation* → 2 – *Installation SAP NetWeaver Systems*
- Unicode Conversion Guides
at <http://service.sap.com/unicode@sap> → Unicode Conversion Guides
- SAP DBA Guide: DB2 for z/OS
at <http://service.sap.com/instguides> → <your SAP system version> → *Operations*

3 Release Strategy

With different SAP NetWeaver releases, you need to perform different steps to implement partition-by-growth table spaces.

General support for partition-by-growth table spaces starts with NetWeaver **7.0 BASIS SP16**. SAP systems with **7.0 BASIS SP14**, which corresponds to SAP NetWeaver SR3, and **7.0 BASIS SP15** can handle partition-by-growth table space creation and table conversion after applying the advanced correction of [SAP Note 1240075](#) using the transaction SNOTE. A patched version of the `lib_dbsl` is needed as well.

Note: For recent information regarding SAP release specific changes and partition-by-growth, see **SAP Note 1225416** at <https://service.sap.com/notes> → <Enter Note Number> ([SAP Note 1225416](#)).

3.i SAP Systems Based on SAP Web AS 6.20 and SAP NetWeaver 6.40

The SAP Dictionary supports partition-by-growth for selected tables starting with **6.20 BASIS SP65** and **6.40 BASIS SP23**. For a step by step documentation, see [Specific Table Spaces Partitioned-by-Growth \(SE14\)](#). For details and additional information see SAP Notes [407663](#) and [686905](#).

3.ii SAP Systems Based on SAP NetWeaver 7.0

Starting with SAP NetWeaver **7.0 BASIS SP16**, the SAP Dictionary and system installation tools are able to deal with partition-by-growth table spaces. This includes default parameters to use this feature for all new table spaces as well as selecting specific tables with the SAP Dictionary.

Partition-by-Growth as the Default

If you prefer that all new table spaces have this new feature, you set SAP profile parameter `db2/db2/maxpartitions` and environment variable `db2_db2_maxpartitions` to the integer value that will be used for all CREATE TABLESPACE statements' MAXPARTITIONS parameter. A `lib_dbsl` patch is necessary in addition to SAP NetWeaver **7.0 BASIS SP 16** for the ABAP dictionary. During system copies and installations, `R3load` and `R3load` patches are necessary as well. For patch versions, see [SAP Note 1225416](#).

As partition-by-growth is only possible for tables not sharing a table space with other tables, you need to extract all tables from XSAP table spaces. To implement this, you need to set the environment variable `db2_db2_no_xsap` and profile parameter `db2/db2/no_xsap`. Patched versions of `R3load` and `db2radm.jar` are necessary.

If you prefer a different DSSI ZE than 4G for all CREATE TABLESPACE statements, then set environment variable `db2_db2_dssi ze` and profile parameter `db2/db2/dssi ze` as well.

Note: If you plan to use ABAP REPORT `SMIGR_CREATE_DDL` to keep DB2 specific parameters, there is no need to add the MAXPARTITIONS parameter to the CREATE statements. The parameter is added within the database interface layer according to the environment just before executing the CREATE TABLESPACE statements on the target system.

For Upgrades with Partition-by-Growth

It is possible to implement partition-by-growth for all single-table table spaces that are created during an SAP System Upgrade. Refer to [SAP Note 815202](#) for details.

For System Copy, Unicode Conversions and New Installations

Proceed as follows:

- a. Set the following environment variables:
 - i. On Unix with sh like shells:


```
export dbs_db2_no_xsap=1
export dbs_db2_maxpartitions=256
export dbs_db2_dssize=4G
```
 - ii. On Unix with csh like shells:


```
setenv dbs_db2_no_xsap 1
setenv dbs_db2_maxpartitions 256
setenv dbs_db2_dssize 4G
```
 - iii. On Windows, set environment variables at *Start* → *Settings* → *Control Panel* → *System* → *Advanced* → *Environment Variables*.

Note: If you start Migration Monitor manually, for example because you are implementing a Unicode conversion with fast load, it is necessary that you set the environment variables as well for the shell where you start Migration Monitor. For this reason, it is handy to have an environment file available that sets all additional environment variables for you.

- b. Create the DIR_CT_RUN directory manually.
 - i. Unix: DIR_CT_RUN is /sapmnt/<SAPSID>/exe
 - ii. Windows: DIR_CT_RUN is <installation drive>\usr\sap\<SAPSID>\SYS\exe\{uc|nuc}\<platform>.
- c. Extract SAPEXEDB. SAR and patched versions of R3load, R3loadI and lib_dbsI in DIR_CT_RUN.
- d. Start SAPinst and pause on the following screen:

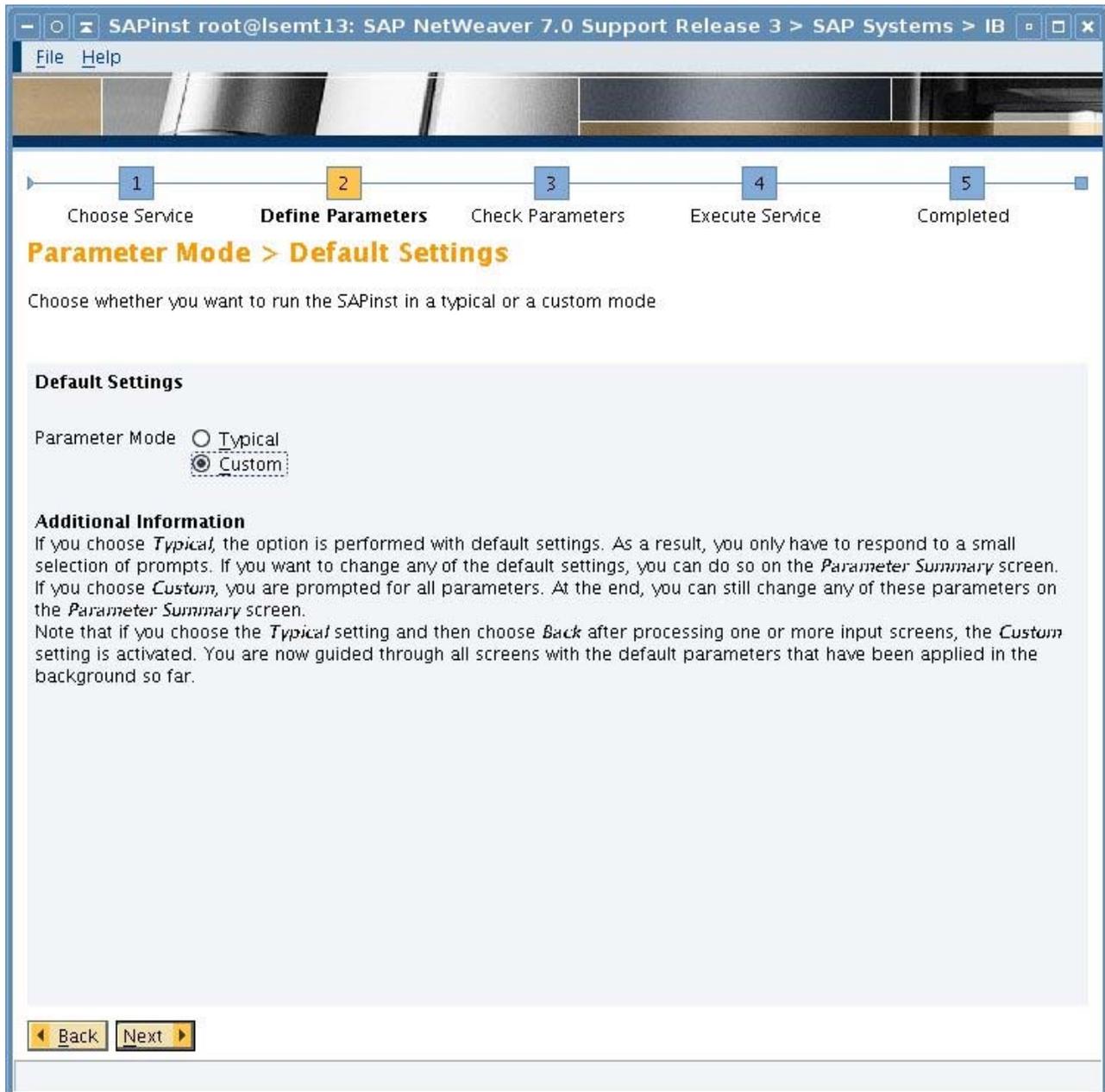


Figure 3-1 Pause on this screen

- e. Copy a patched version of `db2radm.jar` to SAPinst `exe/JAR` temp directory (for example `/tmp/sapinst_exe.16949.1217575703/JAR`). On Windows, the SAPinst `exe` directory is located at the folder `%TMP%`.

If you have to restart SAPinst due to an error or any other reason, you need to update `db2radm.jar` again after the restart.

- f. Select *Custom* as Parameter Mode and then *Next*.
- g. On the following SAPinst dialog, deselect `unpack DB2/SAPEXEDB.SAR`.

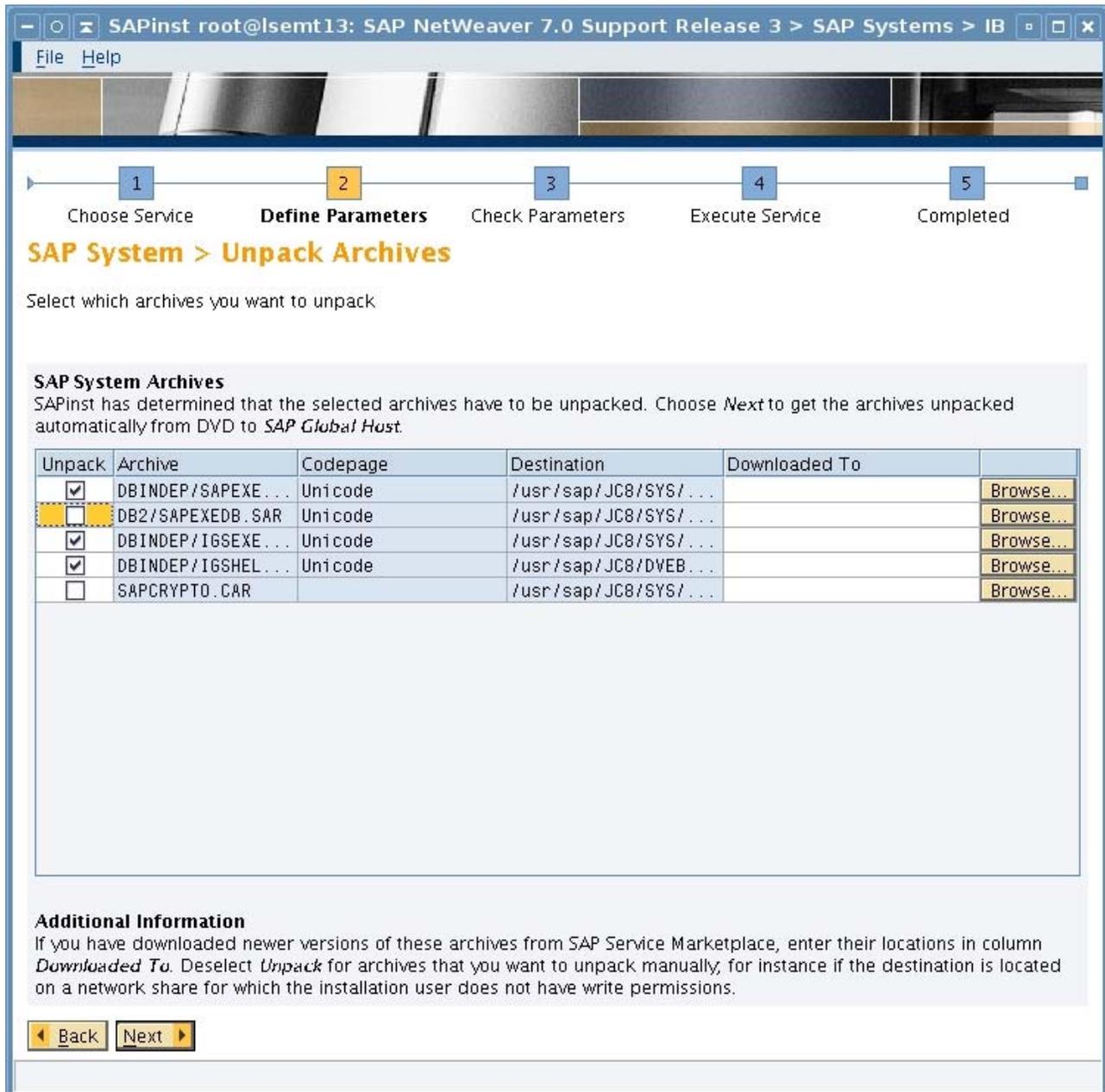


Figure 3-2 Deselect SAPEXEDB.SAR extraction

- h. Once the installation is finished, specify the following profile parameters in the DEFAULT.PFL profile:

dbs/db2/maxpartitions = 256

dbs/db2/dssize = 4G

dbs/db2/no_xsap = 1

- i. Change the environment of the si dadm user.

On Unix, add the following lines to the file `.dbenv_<hostname>.csh`:

setenv dbs_db2_maxpartitions 256

setenv dbs_db2_dssize 4G

On Windows, set environment variables at *Start* → *Settings* → *Control Panel* → *System* → *Advanced* → *Environment Variables*.

- j. If the **SAP BASIS SP** level is **14** or **15**, apply the correction described in [SAP Note 1240075](#) with transaction SNOTE and import **SAP BASIS (SP 15 and) SP16**. Then apply [SAP Note 1240075](#) again.

Specific Table Spaces Partitioned-by-Growth (SE14)

With SAP systems having **BASIS SP16** or higher, partition-by-growth is fully supported also with transaction SE14.

If you plan to use partition-by-growth only for specific table spaces that have a high risk of growing over the 64 GB limit, you can employ the feature in the ABAP dictionary in transaction SE14. SAP uses 256 as default value for MAXPARTITIONS and 4G as default value for DSSIZE. It is possible to change the MAXPARTITIONS parameter online with the SAP dictionary after your SAP system installation. This action does not require a subsequent REORG.

The following steps are necessary to implement partition-by-growth for newly created table spaces:

1. Create the new table in transaction SE11.
2. Before table activation, enter transaction SE14 for the recently created table.
3. Press the button *Storage Parameters*.
4. Press *Display <-> Change*.
5. Press *Partitioned* in the area of the *Target Tablespace*.
6. Select *Growth-partitioned*.
7. Press button *Tablespace* if you want to change defaults for MAXPARTITIONS and DSSIZE.
8. Press Save.
9. Activate the table in transaction SE11.

If you plan to convert an already existing table to use partition-by-growth, proceed as follows:

1. Open transaction SE14 for the target table.
2. Press button *Storage Parameters*.
3. Press *Display <-> Change*.
4. Press *Partitioned* in the area of the *Target Tablespace*.
5. Select *Growth-partitioned*.
6. Press button *Tablespace* if you want to change defaults for MAXPARTITIONS and DSSIZE.
7. Use the back button to get to the entry screen of transaction SE14.
8. Press Save.
9. Select *Extras* → *Force Conversion* from the menu.

Note: Both procedures described here work for buffered tables as well. SAP dictionary and transaction SE14 will move the table from a multi-table table space into a single-table table space.



Figure 3-3 Choose Growth-Partitioned for partition-by-growth in SE14



Figure 3-4 Define MAXPARTITIONS and DSSIZE parameter in SE14

3.iii SAP System Based on SAP NetWeaver 7.01 and Above

For SAP NetWeaver 7.0 Enhancement Package 1, the same strategy is valid for partition-by-growth table spaces as for Netweaver 7.0. The shipped version of the SAP Dictionary is able to handle partition-by-growth table spaces.

If you plan to install your SAP system exclusively with partition-by-growth table spaces, you need `lib_dbs1`, `R3load`, `R3loadctl` and `db2radm.jar` patches and the profile/environment settings as described in the section for [SAP Systems Based on SAP NetWeaver 7.0](#). For patch levels, see [SAP Note 1225416](#).

3.iv SAP System Based on SAP NetWeaver 7.10 and Above

All table spaces created by SAP NetWeaver ≥ 7.10 on DB2 9 for z/OS or higher are created as implicit table spaces. For implicit created table spaces, partition-by-growth is used by default. For additional information regarding implicit object creation, see *Additional Information* → *Database Layout with DB2 V9.1* → *Implicit Object Creation* in [SAP DBA Guide: DB2 for z/OS](#).

Related Content

Unicode Conversion Cookbook	SDN article, technical guideline to implement Unicode Conversions on DB2 for z/OS.
SAP Note 1225416	DB2 z/OS: Additions for partition by growth tablespaces.
SAP Note 1021551	DB2-z/OS System Copy Preserving Partitioning & Table Attributes.
SAP Note 815202	DB2-z/OS: Additions upgrade to SAP NW AS 7.0.
SAP Note 1240075	DB2-z/OS: Partition-by-growth (UTS) & SP14
SAP Note 1237715	DB2 z/OS: Installation: long runtime of ALTER LOCKSIZE stmts
SAP Note 407663	DB2/390: DDIC corrections (6.10, 6.20)
SAP Note 686905	DB2-z/OS: DDIC corrections (6.40, 7.0, 7.10)

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