BMC is releasing version 12.1.00 of the BMC Object Administration for DB2 solution.

BMC Object Administration for DB2 includes the following products:

- CATALOG MANAGER for DB2
- CHANGE MANAGER for DB2
- BMC Next Generation Technology Copy for DB2 for z/OS (NGT Copy)
- BMC Next Generation Technology Load for DB2 for z/OS (NGT Load)
- LOADPLUS for DB2
- SNAPSHOT UPGRADE FEATURE of EXTENDED BUFFER MANAGER for DB2
- BMC Next Generation Technology Unload for DB2 for z/OS (NGT Unload)
- UNLOAD PLUS for DB2
- BMC Workbench for DB2

**Note**
Before you begin installation, BMC recommends that you check the Support Central website at [http://www.bmc.com/support](http://www.bmc.com/support) for:

- Updated product documentation (for example, flashes and technical bulletins)
- Product downloads, patches, and fixes (PTFs)
- Product availability and compatibility data

These release notes supplement and supersede the product documentation and discuss product enhancements.

The following topics are discussed:

What's new ........................................................................................................................... 2

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What's new

These topics describe the changes or new features in this release.

DB2 Object Administration for DB2, version 12.1.00

Version 12.1 of the DB2 Object Administration for DB2 solution includes the following changes.

Solution components

This version of the BMC Object Administration for DB2 solution includes new releases of the following components and technologies:

- CATALOG MANAGER for DB2
- CHANGE MANAGER for DB2
- BMC Next Generation Technology Copy for DB2 for z/OS (NGT Copy for DB2)
- High-speed Apply Engine
- BMC Next Generation Technology Load for DB2 for z/OS (NGT Load for DB2)
- SNAPSHOT UPGRADE FEATURE of EXTENDED BUFFER MANAGER for DB2
- BMC Next Generation Technology Unload for DB2 for z/OS (NGT Unload for DB2)
- BMC Workbench for DB2

The LOADPLUS for DB2 and UNLOAD PLUS for DB2 components have not changed since version 11.2 of the BMC Object Administration for DB2 solution. For a list of features and functions that were new in version 11.2, see the release notes for 11.2.00 of LOADPLUS and UNLOAD PLUS.
Installation System changes

Beginning with version 3.1.00 of the Installation System, new product releases necessitate a new Installation System FMID. Before installing any products, always ensure that you have the most recent version of the Installation System installed and that you have refreshed its runtime environment.

This change enables PTF maintenance for individual levels of the Installation System. The change also eliminates the requirement to provide the Installation Maintenance Value, which simplifies the installation process.

For more information, see the release notes for the most current version of the Installation System.

Support for IBM DB2 Version 12

This release adds support for DB2 Version 12.

This release supports:

- DB2 Version 12
- DB2 Version 11
- DB2 Version 10 in new-function mode (NFM) only

COPY PLUS for DB2 name change

Starting with this release, the name of the COPY PLUS for DB2 product has changed to the BMC Next Generation Technology Copy for DB2 for z/OS (or NGT Copy) product. Affected product panels and documentation use the new name.

RECOVER PLUS for DB2 name change

Starting with this release, the name of the RECOVER PLUS for DB2 product has changed to the BMC Next Generation Technology Recover for DB2 for z/OS (or NGT Recover) product. Affected product panels and documentation use the new name.

Common changes for NGT Load and NGT Unload

Version 12.1.00 of the following NGT utility products includes common changes:

- NGT Load
- NGT Unload
Installation of NGT products

You now use the BMC Installation System to install and configure the NGT products.

Use the following documentation to assist you in installing, configuring, and customizing the NGT products:

- *Installation System Quick Start*
- *Installation System Reference Manual*
- *BMC Products and Solutions for DB2 Customization Guide*

The *BMC Next Generation Technology Installation Guide* is now obsolete.

Authorization ID

The NGT products now enable you to use the DBM1 authorization ID.

Synonyms

The NGT products now use aliases instead of synonyms.

Component and library names

Many of the NGT product components and libraries with names beginning with *CDB* have been renamed to begin with *NGT*.

In most cases, the name change only substitutes *NGT* for *CDB* (for example, CDBDISP is now NGTDISP). CDBEXEC is the exception in that it has been renamed to NGTAUTO. These name changes are reflected in the NGT messages and in the documentation.

Concurrent access control

The following products now use the BMCUTIL and BMCSYNC common tables to control concurrent access to the objects on which they operate. Using these tables does not replace using the BMC Next Generation Technology (NGT) Matrix and the utility internal databases (IDBs).

- NGT Check
- NGT Load
- NGT Reorg
- NGT Stats
- NGT Unload

As part of this enhancement, you can use the NGTDISP utility to display entries from these two tables. For more information about the new options to specify with NGTDISP, see the *BMC Next Generation Technology General User Guide*.

BMC provided this enhancement for version 11.2 via BMC PTFs BPU8370, BPU8384, and BPJ1316.

New component requirement

The NGT products now use the DB2 Solution Common Code (SCC) component. SCC is installed when you install the NGT products.
BMC introduced this requirement for version 11.2 via BMC PTFs BPU8370, BPU8384, and BPJ1316.

**Maintenance listing**

Each NGT product now reports the BMC maintenance that has been applied for that product. This information appears in your CDBPRINT.

**SQL functionality**

The following products now enable you to use an SQL-like language known as NGT SQL:

- NGT Check
- NGT Load
- NGT Reorg
- NGT Unload
- NGT Utility Manager

The NGT utility products use NGT SQL for such specifications as WHERE or WHEN clauses, SELECT lists, and indexes on expression. For more information, see the *BMC Next Generation Technology General User Guide*.

**Utility parameters**

This release adds the following new NGT utility parameters (UTLPARMS):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ALLError</td>
<td>Enables you to set the behavior of SYSERROR</td>
</tr>
<tr>
<td>+DSNUTILB</td>
<td>Specifies whether to enable NGT Reorg to invoke DSNUTILB when needed</td>
</tr>
<tr>
<td>+IGNOREOBJSETPARTS</td>
<td>Specifies whether to disregard partition numbers defined in object sets</td>
</tr>
<tr>
<td>+LOGPDS</td>
<td>Overrides the default log data set name</td>
</tr>
<tr>
<td>+NGTAUTO1</td>
<td>Overrides the default NGT automation data set name</td>
</tr>
<tr>
<td>+NGTAUTO2</td>
<td>Enables you to configure a second NGT automation data set</td>
</tr>
<tr>
<td>+NGTCHKPT</td>
<td>Overrides the default NGT checkpoint data set name</td>
</tr>
<tr>
<td>+NGTSVR</td>
<td>Overrides the default name of the NGT server JCL data set</td>
</tr>
<tr>
<td>+OBJSETSTOGROUP</td>
<td>Defines the storage group that NGT utilities use to store temporary objects</td>
</tr>
<tr>
<td>+OVERRIDEOUTPUT</td>
<td>Specifies whether NGT automation control points override OUTPUT command values</td>
</tr>
<tr>
<td>+USER1 and +USER2</td>
<td>Define user-defined variables that you can use with certain configuration parameters</td>
</tr>
<tr>
<td>+XBMID</td>
<td>Specifies which XBM subsystem to use when NGT Load invokes NGT Copy</td>
</tr>
</tbody>
</table>

For more information about these parameters, see the *BMC Next Generation Technology General User Guide*. 
CATALOG MANAGER, version 12.1.00

Version 12.1.00 of the CATALOG MANAGER component includes the following changes.

Support for DB2 Version 12 features

CATALOG MANAGER supports the following features of DB2 Version 12.

Advanced triggers

CATALOG MANAGER now supports the IBM DB2 Version 12 advanced triggers.

You can create or alter an advanced trigger by entering CREATE or ALTER next to an existing advanced trigger in a list.

When you enter DROP next to an advanced trigger with multiple versions in a list, CATALOG MANAGER only drops the specific version that you selected.

In addition, the DESCRIBE TRIGGER command has been deprecated.

DB2 Version 12 bind syntax

CATALOG MANAGER supports the DB2 Version 12 bind syntax, including the new APPLCOMPAT V12R1Mxxx value of the bind option.

Support for the TRANSFER OWNERSHIP command

With the TRANSFER OWNERSHIP command, you can now transfer ownership of supported objects to a Role or user (defined by the user ID or session ID). You can transfer ownership of the following objects:

- Database
- Index
- Store group
- Table
- Table space
- View

To transfer ownership of an object

1. Generate a list of supported objects.
2. Enter TRANS next to the object.
3. Complete the following panel, and press Enter.

```
Transfer Ownership

Command ===> Generate Commands... N Y to generate

1 to 7 of 7

Scroll ===> PAGE
```

Ability to edit SQL in wide format

In a stored procedure, CATALOG MANAGER can now generate lines of a SQL statement that extend beyond column 72. When the SQL statement is displayed in the Confirm panel, a message indicates that at least one row extends beyond the visible area. You can edit the SQL statement and use the standard TSO keys to shift the display to the right, or keep the statement in a variable-block PDS file that fulfills your record length (LRECL) requirements.

Ability to write uncompressed data to the SQL table

CATALOG MANAGER can now write uncompressed rows of data to the SQL table. The SQL table can contain both uncompressed and compressed rows that originated from earlier versions of the product. CATALOG MANAGER will continue to read both compressed and uncompressed rows of data. Earlier versions of CATALOG MANAGER can neither read nor write uncompressed data from the SQL table.

**WARNING**

CATALOG MANAGER 12.1 saves legacy compressed rows as uncompressed rows. The saved rows are no longer accessible to earlier versions of the product. Attempting to share the corresponding SQL table between CATALOG MANAGER 12.1 and CATALOG MANAGER 11.1 or 11.2 will generate an error message.

Support for BMC Next Generation Technology Reorg for DB2 for z/OS (NGT Reorg)

This release of CATALOG MANAGER lets you generate JCL for the NGT Reorg utility to reorganize table spaces and indexes.

To execute the generated job, you must have a license for the Next Generation Technology Database Reorg product (NGT Reorg) or any BMC solution that includes NGT Reorg.

**Note**

If you select NGT Reorg, CATALOG MANAGER generates the NGT utility SYSIN statement and JCL. NGT Reorg uses dynamic allocation for data sets. NGT Reorg uses your configured NGT automation control points instead of the naming convention defined in your product options file (POF). For more information, see the *BMC Next Generation Technology Automation Reference Manual*.
BMC made this feature available via PTFs BPU8196 and BPU8307, which accompanied a small program enhancement (SPE) in November 2015.

Display and termination of NGT utilities

You can now list the supported NGT utilities, in addition to the BMC classic utilities and DB2 utilities. From the Command line, you can list the NGT utilities by entering either the BMCUTIL or STATUS commands.

**Note**

To generate the STATUS and BMCUTIL lists, CATALOG MANAGER requires that you have SELECT or SYSADM authorization on the BMCUTIL tables.

BMC made this feature available via PTFs BPU8198, BPU8785, and BPU8619, which accompanied a small program enhancement (SPE) in April 2016.

NGT Unload and NGT Load support

This release of CATALOG MANAGER lets you generate JCL for the following products to unload and load data from objects:

- Next Generation Technology Unload for DB2 for z/OS (NGT Unload)
- Next Generation Technology Load for DB2 for z/OS (NGT Load)

To execute the generated job, you must have a license for the Next Generation Technology Database Reorg product (NGT Reorg) or any BMC solution that includes NGT Reorg.

To support this feature, CATALOG MANAGER now supports the following list commands:

- **NGTUNLOAD**, which enables you to invoke NGT Unload to unload an object
- **NGTLOAD**, which enables you to invoke NGT Load to load an object

BMC made this feature available via PTFs BPU8198, BPU8785 and BPU8619, which accompanied a small program enhancement (SPE) in April 2016.

SQL Executer enhancement

This release includes an enhancement to the SQL Executer that CATALOG MANAGER calls to execute DDL, DML, and DCL statements. The SQL Executer can now also execute DSN and DB2 commands.
New POF keywords

The product options file (POF) now supports the following new keywords:

- LL_NAUTO
- LL_NAUTO2
- LL_NAUTO3
- LL_NAUTO4
- LL_NAUTO5

These keywords control the behavior of JCLGEN and the NGTAUTO DD in the execution JCL when -NGTU commands exist in the worklist.

- NGT_UTILDB

This keyword provides the database name for the NGT utility parameter +DBNAME(dbName). NGT Reorg creates and uses a temporary table space in this database.

- USE_NGT_AUTO

This keyword controls the behavior of analysis when generating an -NGTU command into the worklist.

Larger precision for float columns in the table editor

The table editor now supports 17 digits for a double-precision float column. Previously, the maximum precision was 13 digits.

Renaming of BMC COPY PLUS and BMC RECOVER PLUS

Starting with this release, the names of the RECOVER PLUS for DB2 product and the COPY PLUS for DB2 product have changed:

- RECOVER PLUS is now the BMC Next Generation Technology Recover for DB2 for z/OS (NGT Recover) product.

- COPY PLUS is now the BMC Next Generation Technology Copy for DB2 for z/OS (NGT Copy) product.

CATALOG MANAGER panels and messages now use the new names when referring to these products. The renaming of these utilities does not affect existing worklists.

CATALOG MANAGER now supports the following new utility commands:

- NGTCOPY displays panels from which you can create, edit, and submit batch utility jobs for the NGT Copy utility.
NGTRECOVER displays panels from which you can create, edit, and submit batch utility jobs for the NGT Recover utility.

**CHANGE MANAGER, version 12.1.00**

Version 12.1.00 of the CHANGE MANAGER component includes the following changes.

**Support for DB2 Version 12 features**

Version 12.1 of ALTER and CHANGE MANAGER support the following features of IBM DB2 Version 12.

**Support for APPLCOMPAT V12R1Mnnn**

You can now use the new value V12R1Mnnn for the APPLCOMPAT option in native stored procedures.

**Support for LOB compression**

DB2 Version 12 lets you compress LOB table spaces where the base table is in a universal table space (UTS). CHANGE MANAGER supports this feature and lets you specify whether a LOB is compressed in the Create Auxiliary Tablespace and Auxiliary Tablespace Detail panels.

**Support for BUSINESS_TIME enhancement**

IBM DB2 Version 12 supports the INCLUSIVE and EXCLUSIVE options for the BUSINESS_TIME parameter for ALTER TABLE and CREATE TABLE statements. ALTER and CHANGE MANAGER also support this option.

**Support for online index compression**

ALTER and CHANGE MANAGER support the changed behavior of DB2 when you alter the compression value of an index on a universal table space (UTS). DB2 Version 12 places the index into Advisory REORG pending (AREOR) status.

**Verification of the PREVENT_NEW_IXCTRL_PART ZPARM**

The Analysis component of CHANGE MANAGER now verifies the PREVENT_NEW_IXCTRL_PART ZPARM in either of these situations:

- When you LIKE, migrate, or rebuild an index-controlled partitioned table space
- When you include the table space in a full-recovery baseline

---

**Note**

The default value for this ZPARM for DB2 Version 11 was NO. The default for DB2 Version 12 is YES.

**New value for the DDL_MATERIALIZATION ZPARM**

ALTER and CHANGE MANAGER support a new value, ALWAYS_PENDING, for the DDL_MATERIALIZATION ZPARM.
Tolerance of IBM DB2 Version 12 features

Version 12.1 of ALTER and CHANGE MANAGER tolerate the following features of IBM DB2 Version 12:

- Extending range-partitioned table spaces with the PAGENUM RELATIVE attribute of the CREATE TABLESPACE and ALTER TABLESPACE statements
- Enhanced triggers
- TRANSFER OWNERSHIP command
- Foreign keys with the PERIOD BUSINESS_TIME clause
- Inserting partitions into a range-partitioned table space
- INSERT ALGORITHM clause in CREATE TABLESPACE and ALTER TABLESPACE statements
- Unicode columns in an EBCDIC table

Automatic change rules for stored procedures

CHANGE MANAGER can now apply an automatic change rule for the version number of a stored procedure. This feature enables you to specify stored procedures in the comparison of two DB2 catalogs.

Support for spanned records

CHANGE MANAGER can now unload and load existing LOB and XML column data by using spanned records.

To enable spanned records, you must:

- Include DYNULD and SPANNEDRECS in the ALUIN input stream
- Specify one of the following combinations of utilities:
  - IBM UNLOAD and IBM LOAD
  - BMC UNLOAD PLUS and BMC LOADPLUS

Support for NGT Reorg

You can now specify the Next Generation Technology Reorg product (NGT Reorg) to reorganize objects on DB2 Version 10 and 11 subsystems.

To use NGT Reorg, you must:
Specify the DOPTS option REORG=B, or include the BMCREORG keyword in the ALUIN input stream.

Specify the DOPTS option USENGTR=Y, or include the USENGTR keyword in the ALUIN input stream.

The NOUSENGTR keyword lets you override the USENGTR=Y DOPTS option.

To execute the generated job, you must have a license for the Next Generation Technology Database Reorg product (NGT Reorg) or any BMC solution that includes NGT Reorg.

**Support for PLANMGMNT**

This release adds support for the PLANMGMNT rebind option. You can now specify the PLANMGMNT value that ALTER and CHANGE MANAGER use during a rebind operation.

You can make either of the following changes to specify this option:

- Set PLANMGMNT to N (no default), B (basic), or E (extended) in the installation options module. The default is N.

- Add NOPLANMGMNT, PLANMGMNTBASIC, or PLANMGMTEXTENDED to the ALUIN input stream.

BMC made this feature available via the PTF that accompanied a small program enhancement (SPE) in October 2015.

**Toleration of IDAA tables**

The products recognize when a table has been added to IDAA and do not change the definition of the table.

When you attempt to modify an IDAA table, ALTER and CHANGE MANAGER issue an error message and do not generate the worklist.

If you want to modify a standard IDAA table, you can include the IDAAIGNORE keyword in the ALUIN input stream. You cannot modify an IDAA type D table.

**Deprecation of the LOB DATA MOVER program**

The LOB DATA MOVER program is no longer required to move LOB data. BMC has deprecated this program, which was a feature of the BMC Database Administration for DB2 solution.
Product tables

This section lists any new or changed product tables for this release.

Table 1: Changed ALTER and CHANGE MANAGER tables

<table>
<thead>
<tr>
<th>Product table name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CD_COLUMN</td>
<td></td>
</tr>
<tr>
<td>CD_INDEX</td>
<td></td>
</tr>
<tr>
<td>CD_PACKAGE</td>
<td></td>
</tr>
<tr>
<td>CD_REL</td>
<td></td>
</tr>
<tr>
<td>CD_TABLEPART</td>
<td></td>
</tr>
<tr>
<td>CD_TABLESPACE</td>
<td></td>
</tr>
<tr>
<td>CD_TRIGGER</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Changed CHANGE MANAGER tables

<table>
<thead>
<tr>
<th>Product table name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BL_COLUMN</td>
<td></td>
</tr>
<tr>
<td>BL_INDEX</td>
<td></td>
</tr>
<tr>
<td>BL_PACKAGE</td>
<td></td>
</tr>
<tr>
<td>BL_TABLEPART</td>
<td></td>
</tr>
<tr>
<td>BL_TABLESPACE</td>
<td></td>
</tr>
<tr>
<td>BL_TRIGGER</td>
<td></td>
</tr>
</tbody>
</table>

Support for IBM DB2 Version 12

This release now supports the following versions and modes of DB2:

- DB2 Version 12 function level 100
- DB2 Version 12 function level 500
- DB2 Version 11 conversion mode (CM)
- DB2 Version 11 enabling-new-function mode (ENFM)
- DB2 Version 11 new-function mode (NFM)
DB2 Version 10 NFM

NGT Copy, version 12.1.00

Version 12.1.00 of the NGT Copy component includes the following changes.

Copying compressed LOBs

In this release, you can copy compressed large objects (LOBs).

Additional zIIP offload

Starting with this release, NGT Copy offloads substantially more copy processing to the IBM z Integrated Information Processor (zIIP). This capability can reduce central processing (CP) time by 50 percent or more.

NSCMAIN deprecated

This release deprecates the NSCMAIN program. You can now make consistent copies by adding CONSISTENT YES to a COPY command that runs through the ACPMAIN program.

MAXSNAPS option

This release adds the MAXSNAPS option to the DELETE subcommand of the MODIFY command.

This option provides an alternative method of SYSCOPY or BMCXCOPY cleanup. You can specify the number of Instant Snapshot Copies and FlashCopies to retain. When the specified limit is reached, any older Instant Snapshot Copies or FlashCopies are deleted. If you specify ICFDELETE YES, NGT Copy also deletes the image copy data sets.

Reduced time for running the MODIFY command

You can specify the ICFDELETE option on the MODIFY command to write the names of data sets that need to be deleted to a file. Using ICFDELETE reduces the time it takes to run the MODIFY command. You can then delete the data sets from the file at a time convenient for you.
Support for archive-enabled tables

This release adds the AUX ARCHIVE option to support copying archive-enabled tables.

Use of the WHERE option on the DELETE subcommand

With this release, you must comply with the following guidelines when using the WHERE option on the DELETE subcommand:

■ Do not use WHERE within another WHERE clause; use the OR connector option, instead.

■ Do not use the following options with a WHERE option:
   — MAXCOPIES
   — MAXFULLCOPIES
   — MAXRECDAYS
   — MAXSNAPS

New symbolic variable &PART4

This release adds the &PART4 symbolic variable that you can use for any data set. &PART4 generates 4-character partition numbers.

Substrings of symbolic variables

With this release, you can use substrings of symbolic variables in data set names.

Access to the SYSLGRNX table if you are using IBM DB2 Version 10

With this release, NGT Copy no longer supports indirect access to the SYSIBM.SYSLGRNX table but supports direct access as follows:

■ If you are using IBM DB2 Version 10, ensure that CATMAINT has been executed for IBM APARs PM35190 and PM55333. These APARs define the SYSLGRNX table in the DB2 catalog. With the APARs applied, NGT Copy can access SYSLGRNX directly via the DB2 catalog.

■ If you are using DB2 Version 11 or later, you have direct access to SYSLGRNX; starting with Version 11, DB2 automatically defines SYSLGRNX in the DB2 catalog.
New SCOPE STATUS option

This release adds the SCOPE STATUS option to the COPY object options. SCOPE STATUS allows you to copy only objects that are in a specified status, such as COPY pending.

High-speed Apply Engine, version 12.1.00

Version 12.1.00 of the High-speed Apply Engine component includes the following changes.

InactivityInterval parameter

This release adds the InactivityInterval parameter to the MonitorTuning parameters. The new parameter specifies how long (in seconds) the High-speed Apply Engine should wait before reporting the status of agents if no units of recovery have been committed.

NGT Load, version 12.1.00

Version 12.1.00 of the NGT Load component includes the following changes.

Object support

NGT Load now supports the following objects:

- Indexes that are defined with BUSINESS_TIME WITHOUT OVERLAPS
- Table spaces that have been altered but do not have system pages

Dynamic allocation of data sets

The NGT Load, NGT Unload, and NGT Reorg products now enable you to use the NGT OUTPUT command to dynamically allocate certain data sets.

In addition to this new command, you can use the new utility parameter +OVERRIDEOUTPUT. This parameter enables you to specify whether to dynamically allocate data sets by using the OUTPUT command or by using the appropriate automation control point.

For syntax information about the OUTPUT command and the +OVERRIDEOUTPUT parameter, see the BMC Next Generation Technology General User Guide. For
information about which data sets you can allocate with the OUTPUT command, see the reference manuals for the individual products.

**Compression dictionaries**

NGT Load now builds a dictionary when all of the following conditions exist:
- You specify LOAD RESUME YES.
- A dictionary does not currently exist on the table space.
- The table space is defined with COMPRESS YES.

For more information, see the compression dictionaries topic in the *BMC Next Generation Technology Load for DB2 for z/OS Reference Manual*.

**Command options**

This release provides several new command options and changes to existing options for NGT Load. This topic briefly describes the new and changed options that these release notes have not already described. For more information about these options, see the *BMC Next Generation Technology Load for DB2 for z/OS Reference Manual*.

**FORMAT**

NGT Load no longer supports FORMAT ARCHIVE.

**PREFORMAT**

NGT Load now accepts values of YES or NO with PREFORMAT. (You can also specify PREFORMAT without a value, which NGT Load treats as PREFORMAT YES.)

**RESUME**

You can now specify LOAD RESUME NO, which enables you to load data into an empty table space. NGT Load terminates if the table space is not empty.

*Note*

This behavior differs from the behavior that results when you default to LOAD RESUME NO.

**SHRLEVEL**

You can now specify SHRLEVEL CHANGE and SHRLEVEL REFERENCE with LOAD REPLACE:
LOAD REPLACE SHRLEVEL CHANGE enables read/write access to the table space or partition that you are loading, but replaces all data during the load.

LOAD REPLACE SHRLEVEL REFERENCE enables read-only access to the table space or partition that you are loading, and replaces all data during the load.

**LOADPLUS command syntax**

NGT Load supports the following LOADPLUS for DB2 command options:

- **ORDER YES** enables you to sort rows in clustering index order. This option overrides the NGT Load +SORT parameter.

- **REDEFINE** tells NGT Load whether to delete and redefine the VSAM data sets for the DB2 objects that are participating in the load.

- **DELETEFILES** enables you to delete the INFO and OUT files after the load completes successfully. This option overrides the NGT utilities +DELETEOUTPUT parameter.

- **CHECKPEND** tells NGT Load whether to set dependent table spaces to CHECK pending status. This option overrides the NGT Load +SETCHECKPEND parameter.

- **UPDATEDB2STATS** tells NGT Load whether to update statistics in the DB2 catalog. This option overrides the NGT Load +RUNSTATS parameter.

- **IDENTITYOVERRIDE** tells NGT Load whether to load identity column values from an input file when the identity column is defined as GENERATED ALWAYS.

- **DRAIN_WAIT** enables you to specify how long to hold a drain. This option overrides the value of the first subparameter of the NGT utilities +QRETRY parameter.

- **APCOMMIT** enables you to specify the number of records to insert per commit during a LOAD RESUME YES SHRLEVEL CHANGE job. This option overrides the NGT Load +COMMIT parameter.

- **COPY** tells NGT Load whether to produce a copy during the load.

- **OBID** enables you to specify the object ID of your input file.

- **SKIPFIELDS** is a synonym for the existing IGNOREFIELDS option.

- **REPLACE** and RESUME YES on your INTO TABLE statement enable you to tell NGT Load how to load data at the partition level.
LOADPLUS, version 11.2.00

The LOADPLUS component has not had a new release since 11.2.00 of the BMC Object Administration for DB2 solution. However, version 11.2.00 of LOADPLUS now tolerates DB2 Version 12 via BMC PTFs BPU8707 and BPU8709.

Note

For a list of features and functions that were new in 11.2.00 of LOADPLUS, see the release notes for 11.2.00 of LOADPLUS.

SNAPSHOT UPGRADE FEATURE of XBM, version 6.2.01

Version 6.2.01 of the EXTENDED BUFFER MANAGER (XBM) for DB2 product and its SNAPSHOT UPGRADE FEATURE technology includes the following changes.

Support for IBM DB2 Version 12.x.xxx and its use of the 64-bit I/O interface to IBM Media Manager

This release adds support for DB2 Version 12.

This release supports:

- DB2 Version 12
- DB2 Version 11
- DB2 Version 10

XBM can now use the IBM Media Manager tool via the 64-bit I/O interface that is available if you are running Version 2.1 or later of the IBM z/OS system. This feature is needed to enable XBM to support IBM DB2 Version 12.x.xxx (that is, all function levels of DB2 Version 12). This does not affect your use of earlier versions of DB2; XBM continues to support these versions.

BMC Software made this feature available via PTF BPE0456 that accompanied a small program enhancement (SPE) in October 2016.

NGT Unload, version 12.1.00

Version 12.1.00 of the NGT Load component includes the following changes.
LOB data

You can now unload a LOB auxiliary table and its base table at the same time without an NGT LOBMaster license.

NGT Unload enables this support by adding the SPANNED YES command option. This option tells NGT Unload to unload your data in spanned record format. For more information about this option, see the *BMC Next Generation Technology Unload for DB2 for z/OS Reference Manual*.

BMC provided this enhancement for version 11.2 via the BMC PTF BPU8352.

Dynamic allocation of data sets

The NGT Load, NGT Unload, and NGT Reorg products now enable you to use the NGT OUTPUT command to dynamically allocate certain data sets.

In addition to this new command, you can use the new utility parameter +OVERRIDEOUTPUT. This parameter enables you to specify whether to dynamically allocate data sets by using the OUTPUT command or by using the appropriate automation control point.

For syntax information about the OUTPUT command and the +OVERRIDEOUTPUT parameter, see the *BMC Next Generation Technology General User Guide*. For information about which data sets you can allocate with the OUTPUT command, see the reference manuals for the individual products.

UNLOAD command

This release adds the UNLOAD command to NGT Unload. This command provides the following options that were available with the BMC UNLOAD PLUS for DB2 product:

<table>
<thead>
<tr>
<th>Option</th>
<th>Brief description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTOTAG</td>
<td>Adds a four-byte character constant value at the beginning of each output record</td>
</tr>
<tr>
<td>CNTLCARDS</td>
<td>Indicates the type of control statements to write to the SYSCNTL data set</td>
</tr>
<tr>
<td>CNTLDDN</td>
<td>Overrides the default DD name or default DD name prefix of the data set that contains generated control statements</td>
</tr>
<tr>
<td>DELETEFILES</td>
<td>Specifies whether to delete SYSREC and SORTWK files when the unload is unsuccessful</td>
</tr>
<tr>
<td>DISCARDS</td>
<td>Defines a limit on the number of records to discard</td>
</tr>
<tr>
<td>DRAIN_WAIT</td>
<td>Specifies the drain timeout value to use</td>
</tr>
<tr>
<td>Option</td>
<td>Brief description</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ESTROWS</td>
<td>Indicates the number of rows that you expect to unload based on the SELECT statement</td>
</tr>
<tr>
<td>FILL</td>
<td>Specifies whether to fill numeric external fields with zeros when converting numeric columns to their external representations</td>
</tr>
<tr>
<td>FILTERPART</td>
<td>Specifies whether to filter out partitions that do not meet the WHERE clause criteria when you use the first column of the partitioning key in your WHERE clause</td>
</tr>
<tr>
<td>FIXEDVARCHAR</td>
<td>Specifies whether to unload variable column values as variable-length or fixed-length fields when you do not explicitly specify a field type</td>
</tr>
<tr>
<td>INFFILE</td>
<td>Unloads from copy data sets, including cabinet copies that have been created by the BMC Recovery for DB2 solution</td>
</tr>
<tr>
<td>INTO</td>
<td>Defines your output records by including a field specification</td>
</tr>
<tr>
<td>LIMIT</td>
<td>Defines a limit on the number of records selected from each table or partition of the table space</td>
</tr>
<tr>
<td>NOSUBS</td>
<td>Tells NGT Unload to not accept substitution characters during CCSID translation</td>
</tr>
<tr>
<td>NULLTYPE</td>
<td>Specifies the location and length of the null indicator field in the output record</td>
</tr>
<tr>
<td>ON FAILURE</td>
<td>Specifies how to handle an abnormal termination</td>
</tr>
<tr>
<td>ORDER</td>
<td>Specifies whether to sort the output records</td>
</tr>
<tr>
<td>RECORDID</td>
<td>Specifies a record identifier for each output record of a SELECT statement</td>
</tr>
<tr>
<td>RETRY</td>
<td>Specifies the maximum number of times to attempt to obtain a drain before terminating</td>
</tr>
<tr>
<td>RETRY_DELAY</td>
<td>Specifies the minimum number of seconds to wait after a drain timeout before trying again</td>
</tr>
<tr>
<td>TABLESPACE</td>
<td>Unloads all supported data from a table space with a single command</td>
</tr>
<tr>
<td>UNLOADDN</td>
<td>Specifies the default DD name, DD name prefix, or output descriptor for unload output data sets</td>
</tr>
<tr>
<td>ZONEDDECOVP</td>
<td>Assigns overpunch values to decimal-zoned numeric values</td>
</tr>
</tbody>
</table>

For more information, see the *BMC Next Generation Technology Unload for DB2 for z/OS Reference Manual*. This reference manual includes syntax diagrams and descriptions for both the UNLOAD and UNLD commands.

**Note**

UNLOAD is the preferred command for NGT Unload. BMC will make no more enhancements to the UNLD command and plans to deprecate it in a future release.
FORMAT option

The NGTUnload UNLD command no longer supports FORMAT ARCHIVE and FORMAT REPORT.

Cabinet copies

NGT Unload now enables you to unload from cabinet copies that have been created by the BMC Recovery Management for DB2 solution or the BMC Recovery for DB2 solution.

To unload from a cabinet copy, specify INFILE IMAGECOPY on the UNLOAD command. For more information about this option, see the BMC Next Generation Technology Unload for DB2 for z/OS Reference Manual.

Note

This release adds the UNLOAD command to NGT Unload. For more information, see “UNLOAD command” on page 20.

Unloading from a table space

NGT Unload now enables you to unload all supported data from all tables of a table space by using a single command.

To unload a table space, specify TABLESPACE on the UNLOAD command. For more information about this option, see the BMC Next Generation Technology Unload for DB2 for z/OS Reference Manual.

Note

This release adds the UNLOAD command to NGT Unload. For more information, see “UNLOAD command” on page 20.

Field specification for an output record

NGT Unload now enables you to define your output records by including a field specification on your syntax statement.

To include this specification, use the INTO option on the UNLOAD command. For more information about this option, see the BMC Next Generation Technology Unload for DB2 for z/OS Reference Manual.
Note
This release adds the UNLOAD command to NGT Unload. For more information, see “UNLOAD command” on page 20.

UNLOAD PLUS, version 11.2.00

The UNLOAD PLUS component has not had a new release since version 11.2.00 of the BMC Object Administration for DB2 solution. However, version 11.2.00 of UNLOAD PLUS now tolerates DB2 Version 12 via BMC PTFs BPU8707 and BPU8710.

Note
For a list of features and functions that were new in version 11.2.00 of UNLOAD PLUS, see the release notes for version 11.2.00 of UNLOAD PLUS.

BMC Workbench, version 12.1.00

Version 12.1.00 of the BMC Workbench component includes the following changes.

Object set management in BMC Workbench

The BMC Workbench for DB2 product now enables you to manage object sets, which are used by the RECOVERY MANAGER and DASD MANAGER PLUS products, and by certain NGT utilities.

Note
In BMC Workbench, you can edit only object sets that were created by using BMC Workbench. However, you can resolve, copy, and view object sets from all sources.

For more information, view the Quick Course "Workbench for DB2 - Managing object sets," the BMC Workbench for DB2 User Guide, and the BMC Workbench online Help.

Users who have a license for any of the following simplified solutions can access and use BMC Workbench to manage object sets:

- BMC High Speed Utilities for DB2
- BMC Object Administration for DB2
- BMC Recovery for DB2
- BMC Performance for DB2SQL
- BMC Performance for DB2 Databases
BMC Utility Management for DB2
BMC Large Object Management for DB2

Setting up the NGT Utility Manager in BMC Workbench

The BMC Workbench for DB2 product now enables you to view, edit, and create records in the Criteria, Exceptions, and Schedule BMC Next Generation Technology (NGT) Utility Manager tables.

For more information about these tables, see the BMC Next Generation Technology Utility Manager for DB2 for z/OS Reference Manual.

For more information, view the Quick Course "Workbench for DB2 - Setting up NGT Utility Manager", the BMC Workbench for DB2 User Guide, and the BMC Workbench online Help.

You can use this feature if you have a license for any of the following simplified solutions:

- BMC High Speed Utilities for DB2
- BMC Object Administration for DB2
- BMC Recovery for DB2
- BMC Performance for DB2SQL
- BMC Performance for DB2 Databases
- BMC Utility Management for DB2
- BMC Large Object Management for DB2

Note
BMC Next Generation Technology Utility Manager for DB2 for z/OS is only available as part of various DB2 solutions, including BMC Utility Management for DB2.

Product Tools perspective

The product now includes the Product Tools perspective that enables you to manage object sets, and set up or view the NGT Utility Manager tables.

Note
This perspective is not included in the default layout. To add the perspective, see the section about managing a workspace layout in the BMC Workbench for DB2 User Guide.
**Minimum Adobe Flash requirement**

Starting with version 12.1, BMC Workbench requires that you install Adobe Flash version 22.0.0.000 or later.

**Summary of enhancements since the release of version 1.1 in May 2015**

Following the version 1.1 release of BMC Workbench in May 2015, BMC made some significant features available via PTFs accompanying small program enhancements (SPEs).

BMC Workbench version 12.1.00 now includes these additional features:

- Edit and generate Alter DDL for the following objects:
  - Databases
  - Table spaces
  - Tables
  - Indexes
  - Storage groups
  - Native procedures

- Compare schemas. You can receive a count and list of objects to be created, altered, or dropped and their corresponding DDL statements. You can make the following comparisons:
  - Catalog to catalog
  - DDL to DDL
  - Catalog to DDL
  - DDL to catalog

- Generate recovery progress reports and verify recoverability for an object set. You can submit JCL to refresh the Recoverability report. You can also estimate backup and recovery time for an object set.

  To use this feature, you must have a license for the BMC Recovery for DB2 solution.

**Installation, maintenance, and migration**

You install BMC Object Administration for DB2 by using the Installation System.
Installing the Installation System or a product

The Installation System is installed and maintained by using SMP/E. Installing the Installation System creates the required SMP/E environment. Use the following procedures to install the Installation System or products.

**Before you begin**

If you need more information, see these sources:

- For software, hardware, and other requirements, see the Installation System documentation.
- For information about installation changes, see the Installation System release notes.

If you prefer physical installation media instead of downloaded images, request physical media from your BMC sales representative. Contact information is available on the BMC website.

**To install the Installation System**

1. Review the most recent Installation System release notes on any product page from the A-Z Supported Product List on Support Central.


3. Click Installation System.

4. Click the method you want to use to obtain the Installation System, and follow the provided procedures.

**WARNING**

The Installation System must be installed into its own SMP/E zone. You should not install anything else into this zone.

**To install a product**

1. Ensure that you have the most recent version of the Installation System installed and that it has any required PTFs applied.

To determine the most recent version number, see the most recent Installation System release notes on any product page from the A-Z Supported Product List on Support Central. To determine the version number of your current Installation
System, see the title line on the Installation System Main Menu. Required PTFs are announced in technical bulletins.

2 Start the Installation System.

3 Follow the on-screen prompts.
   For more information, see the Installation System documentation.

Maintaining the Installation System or a product

Use the following procedures to maintain the Installation System or products.

Note
BMC provides fixes for BMC Object Administration for DB2 at the component level. To apply fixes for this solution, you must apply fixes for each component of the solution.

To maintain the Installation System

1 Perform one of the following actions:
   - If you have the most recent version of the Installation System installed, apply any required PTFs.
   - Install the most recent version of the Installation System, and apply any required PTFs.

To determine the most recent version number, see the most recent Installation System release notes on any product page from the A-Z Supported Product List on Support Central. To determine the version number of your current Installation System, see the title line on the Installation System Main Menu. Required PTFs are announced in technical bulletins.

2 Refresh the Installation System runtime data sets by running the $205RTEC and $206RTEC jobs (in order).

3 Restart the Installation System.

To maintain a product

1 Check Support Central for product notices, such as technical bulletins about fixes and Recommended Service Level (RSL) availability.

2 Use BMC ISR (recommended) to obtain product PTFs and RSLs.
3 Run the $176APLF installation job to ensure that all required FMIDs are applied.

4 Apply the product maintenance to the product's SMP/E environment.
   For more information, see Installation System Reference Manual.

**FMID and version information**

BMC Object Administration for DB2 uses version 3.1.00 (or more recent) of the Installation System.

*Note*

Always use the most recent version of the Installation System and ensure that it has any required PTFs applied.
To determine the most recent version number, see the most recent Installation System release notes on any product page from the A-Z Supported Product List on Support Central. To determine the version number of your current Installation System, see the title line on the Installation System Main Menu. Required PTFs are announced in technical bulletins.

Installation installs the following versions and SMP/E FMIDs:

<table>
<thead>
<tr>
<th>FMID</th>
<th>Product or component</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASAR71C</td>
<td>SAS_C and SAS_C++ V71</td>
<td>7.1</td>
</tr>
<tr>
<td>BBASC70</td>
<td>SAS_C V70B 70</td>
<td>7.0</td>
</tr>
<tr>
<td>BBYXM13</td>
<td>BASE TECHNOLOGY</td>
<td>1.3</td>
</tr>
<tr>
<td>LOSZ120</td>
<td>RTCS C Library</td>
<td>2.0</td>
</tr>
<tr>
<td>ZACMC10</td>
<td>CHANGE MANAGER for DB2</td>
<td>12.1</td>
</tr>
<tr>
<td>ZACPC10</td>
<td>BMC NGT Copy for DB2</td>
<td>12.1</td>
</tr>
<tr>
<td>ZACSC10</td>
<td>CATALOG MANAGER for DB2 API</td>
<td>12.1</td>
</tr>
<tr>
<td>ZACTC10</td>
<td>CATALOG MANAGER for DB2</td>
<td>12.1</td>
</tr>
<tr>
<td>ZADUB20</td>
<td>UNLOAD PLUS for DB2</td>
<td>11.2</td>
</tr>
<tr>
<td>ZAEXC10</td>
<td>Execution for DB2</td>
<td>12.1</td>
</tr>
<tr>
<td>ZAFRC10</td>
<td>BMC NGT Recover for DB2</td>
<td>12.1</td>
</tr>
<tr>
<td>ZAIN031</td>
<td>Install Execution Code</td>
<td>3.1</td>
</tr>
<tr>
<td>ZAMUB20</td>
<td>LOADPLUS for DB2</td>
<td>11.2</td>
</tr>
<tr>
<td>ZAPTC10</td>
<td>High Speed Apply Engine</td>
<td>12.1</td>
</tr>
<tr>
<td>ZASHC10</td>
<td>COMMON ADMIN CODE</td>
<td>12.1</td>
</tr>
<tr>
<td>FMID</td>
<td>Product or component</td>
<td>Version</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>ZATSC10</td>
<td>BMCSTATS API</td>
<td>12.1</td>
</tr>
<tr>
<td>ZAUP241</td>
<td>BMCSORT</td>
<td>2.4</td>
</tr>
<tr>
<td>ZBMR15E</td>
<td>ISR External Routines</td>
<td>1.5</td>
</tr>
<tr>
<td>ZBST100</td>
<td>BMC Support Tool</td>
<td>1.0</td>
</tr>
<tr>
<td>ZDBCA10</td>
<td>DB2 Component Services</td>
<td>10.1</td>
</tr>
<tr>
<td>ZDHS053</td>
<td>DNA Host Services</td>
<td>5.3</td>
</tr>
<tr>
<td>ZDIG1A0</td>
<td>DIGNUS C runtimes and C++ objects</td>
<td>1.10</td>
</tr>
<tr>
<td>ZDIG190</td>
<td>DIGNUS C runtimes and C++ objects</td>
<td>1.9</td>
</tr>
<tr>
<td>ZD2UB20</td>
<td>Utilities Common Component</td>
<td>11.2</td>
</tr>
<tr>
<td>ZGUDC10</td>
<td>BMC Workbench for DB2</td>
<td>12.1</td>
</tr>
<tr>
<td>ZLGCA10</td>
<td>DB2 Product Configuration</td>
<td>10.1</td>
</tr>
<tr>
<td>ZMRE110</td>
<td>Rules Engine &quot;'c'&quot; code</td>
<td>1.1</td>
</tr>
<tr>
<td>ZNGTC10</td>
<td>NEXT GENERATION TECHNOLOGY</td>
<td>12.1</td>
</tr>
<tr>
<td>ZOSZ210</td>
<td>RTCS Kernel</td>
<td>2.1</td>
</tr>
<tr>
<td>ZPSSC10</td>
<td>Common Explain component</td>
<td>12.1</td>
</tr>
<tr>
<td>ZPWD330</td>
<td>BMC Password Security System</td>
<td>3.3</td>
</tr>
<tr>
<td>ZSCCC10</td>
<td>Solution Common Code</td>
<td>12.1</td>
</tr>
<tr>
<td>ZUIM550</td>
<td>User Interface Middleware</td>
<td>5.5</td>
</tr>
<tr>
<td>ZUSC550</td>
<td>UIM Common Services</td>
<td>5.5</td>
</tr>
<tr>
<td>ZXBM620</td>
<td>EXTENDED BUFFER MANAGER</td>
<td>6.2</td>
</tr>
<tr>
<td>ZZIOC10</td>
<td>DB2 Options Carryover</td>
<td>12.1</td>
</tr>
</tbody>
</table>

The preceding table contains the FMIDs for BMC Object Administration for DB2 only. You can also obtain product, solution, and component information (FMIDs, codes, and versions) in the following ways:

- View the generated installation JCL member $176APLF.
  To search the file, search on the word FORFMID.

- View one of the following reports:
  — Optimization products, common products, and common components
  — BMC products for IBM DB2
  — BMC products for IBM IMS
  — MainView products
  To access the reports on Support Central, take the following steps:

2 Click Product codes and FMIDs.

3 Click one of the listed reports.

**Migration considerations for EXTENDED BUFFER MANAGER and SNAPSHOT UPGRADE FEATURE**

XBM and its SNAPSHOT UPGRADE FEATURE tolerate interoperation between two consecutive releases (for example, 6.1 and either 6.2.00 or 6.2.01) for migration purposes.

The following considerations apply to this toleration:

- When operating in a mixed environment, do not attempt to use features that have been added in the latest release. If XBM sends these requests to a subsystem that is using the previous release of XBM, XBM might abend.

- Do not operate long term in a mixed environment. BMC recommends that you migrate your entire environment as soon as you can.

- BMC provides limited support for interoperability problems.

For migration from XBM 6.1 to 6.2.00 or 6.2.01, complete the following steps:

1. Install PTF BPE0440 into the XBM 6.1 load library and restart the XBM 6.1 systems as soon as possible.
   
   After installing this PTF, if XBM 6.1 encounters a request for an XBM 6.2 feature, XBM fails gracefully instead of abending.

2. Ensure that all maintenance has been applied for both releases of XBM.

3. For each XBM in a sysplex group, complete the following steps:
   
   a. If active snapshots exist, bring XBM 6.2.00 or 6.2.01 into the XBM sysplex group on each system before you stop the XBM on that system.

   b. Start the updated XBM 6.2 system.
      
      Active snapshots will be synchronized with the new XBM version.

   c. Stop XBM 6.1 on that system.
Support status

You can find the support status for specific product versions on the Support Central website. Selecting a product from the “A – Z Supported Product List” shows:

- All versions of the product and their current support levels (full or limited)
- Dates on which support ends

For more information about the latest support policies, see the Support Central website at http://www.bmc.com/support.

Product documentation

From the Support Central website (http://www.bmc.com/support), you can:

- Link to the BMC Documentation Center to browse documentation sets (http://www.bmc.com/available/documentation-center.html or, for secured documentation sets, http://www.bmc.com/available/documentation-center-secure.html)

- View Quick Course videos (short overviews of selected product concepts, tasks, or features), which are available from the following locations:
  - Documentation Center (primary center and secured center)
  - Support Central (at http://www.bmc.com/support/mainframe-demonstrations)
  - BMC Mainframe YouTube channel (https://www.youtube.com/user/BMCSoftwareMainframe)

- View individual product documents (books and notices) within the “A – Z Supported Product List” (https://webapps.bmc.com/support/faces/az/supportlisting.jsp)

You can order hardcopy documentation from your BMC sales representative or from the support site. You can also subscribe to proactive alerts to receive e-mail messages when notices are issued.

Customer support
If you have problems with or questions about a BMC product, see the support website at http://www.bmc.com/support. You can view or download product documents, find answers to frequently asked questions, and download products and maintenance. If you do not have access to the web and you are in the United States or Canada, contact Customer Support at 1 800 537 1813. Outside the United States or Canada, contact your local BMC office or agent.

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