

Toad® IBM® DB2® z/OS® Components

Installation Guide



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Toad IBM DB2 z/OS Components 8.0
Installation Guide
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Table of Contents

| | |
|------------------------------------------------------------------------|-----------|
| Table of Contents | 1 |
| Why Install Toad IBM DB2 z/OS Components | 2 |
| Prepare to Install Toad IBM DB2 z/OS Components | 2 |
| Mainframe Requirements | 2 |
| Other WLM Environment Requirements | 3 |
| Privileges Required | 3 |
| For Installing the z/OS Component | 3 |
| For Running the z/OS Component | 3 |
| IBM DB2 Subsystem Performance Requirement | 3 |
| Catalog IBM DB2 Subsystem Before Installation | 4 |
| Install Toad IBM DB2 z/OS Components | 5 |
| Why Manually Transfer the Installation Files? | 8 |
| Perform the Transfer Manually | 9 |
| Mainframe Objects | 11 |
| IBM DB2 Objects | 12 |
| Purpose of QCIVP | 13 |
| Where QCIVP Resides | 13 |
| How to Run QCIVP | 13 |
| Reasons for Editing QCIVP | 14 |
| Edit QCIVP | 15 |
| Enable Application Tracing | 15 |
| Disable Application Tracing | 16 |
| Enable Application Tracing and Change the Default DB2 SSID | 16 |
| Change the Default DB2 SSID Without Enabling Application Tracing | 17 |
| About Us | 19 |
| We are more than just a name | 19 |
| Our brand, our vision. Together. | 19 |
| Contact Quest | 19 |
| Technical Support Resources | 19 |
| Index | 20 |

Why Install Toad IBM DB2 z/OS Components

You must install the Toad IBM DB2 z/OS Components on each IBM DB2 for z/OS subsystem that you want to manage using Toad for IBM DB2. The z/OS components enables you to use Toad to perform the following functions on the IBM DB2 subsystem:

- Bind and rebind packages and plans
- Invoke utilities and commands within scripts that Toad for IBM DB2 advanced alters and migrations generate
- Run stand-alone IBM DB2 utilities in Toad
- Run IBM DB2 for z/OS commands from the Editor
- Remotely execute IBM DB2 for z/OS scripts
- Create, alter, or drop dataset templates
- Run DISPLAY, START and STOP commands on databases, tablespaces and indexes
- Access accurate bufferpool information
- View volumes available for defining storage
- Access information about the current threads connected to the IBM DB2 subsystem
- Assign a RACF group to a Toad Security role

Prepare to Install Toad IBM DB2 z/OS Components

After you install Toad for IBM DB2 on the client machine, install the Toad IBM DB2 z/OS Components on each IBM DB2 subsystem that you want Toad to manage. Review this section to ensure that the proper user privileges and system requirements are in place for each IBM DB2 subsystem.

Mainframe Requirements

Before installing Toad IBM DB2 z/OS Components, ensure that your mainframe meets the following minimum hardware and software requirements:

| | |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Database Server | IBM DB2 for z/OS version 9 or later |
| WLM application environments | Two WLM application environments are required. The environments must be defined using ISPF Application <code>IWMARINO</code> . <i>z/OS VIR6.0 MVS Planning Workload Management (SA22-7602-06)</i> provides instructions for using the WLM ISPF panels. Note: The z/OS components must have these two WLM environments for its <i>exclusive</i> use. Do not attempt to use pre-existing WLM environments used for other applications. |
| Resource Recovery Services | Resource Recovery Services (RRS) subsystem installed and active for your DB2 WLM application environment. <i>z/OS VIR6.0 MVS Programming Resource Recovery (SA22-7616-04)</i> and <i>z/OS VIR4.0 MVS System Commands (SA22-7627-11)</i> provide instructions for setting up and starting RRS on your system. |

Other WLM Environment Requirements

For WLM usage, verify that the load module `SORT` is in the Link Pack Area (LPA) or is marked as reentrant. Due to limitations of the WLM address space starting in Program Status Word (PSW) key 8, a non-reentrant `SORT` load module causes an `ABEND SOC4` when `DSNUTILB` calls `SORT` during utility processing.

Note: When running `SYNCSORT` in the WLM environment, users might receive `ABEND SOC4` errors when `DSNUTILB` calls `SYNCSORT`. You can contact `SYNCSORT` to obtain a fix tape that contains support for IBM DB2 stored procedures. This fix applies ZAPs to the current `SORT` modules, and then creates a new `SORT` stub and aliases to a new reentrant module `SYNCFNI`. The documentation accompanying the tape provides instructions for applying the fix.

Privileges Required

For Installing the z/OS Component

Generally, any user can run the Toad IBM DB2 z/OS Components Installation wizard. However, one phase in the installation is to transfer installation files from the Toad client to the mainframe. If you want the wizard to automatically perform this transfer, the user ID running the wizard must have permissions to FTP the files.

After the wizard finishes its part of the installation process, the user must perform additional tasks on the mainframe to complete the z/OS components installation. The user who performs these post-wizard tasks must have the following privileges and authorities:

- `SYSADM` privileges in order to run `SPUFI` scripts and to create objects
- `EXECUTE` authority on all packages in the `DSNAOCLI` collection

Generally, a systems programmer performs the post-wizard tasks.

For Running the z/OS Component

The `permhlg.JCLLIB (GRANTS)` member predefines the privileges required to run the z/OS components. One of the post-wizard installation tasks is to edit and execute this member to grant these permissions to the authorization IDs you specify in the member.



IBM DB2 Subsystem Performance Requirement

To improve overall z/OS components performance on the IBM DB2 subsystem, define an index on the `OWNER` column in `SYSIBM.SYSPLAN` in the subsystem.

Catalog IBM DB2 Subsystem Before Installation

Before installing Toad IBM DB2 z/OS Components, make sure that the IBM DB2 for z/OS subsystem on which you are installing the z/OS components is cataloged on your Toad DB2 client.

To catalog IBM DB2 subsystem

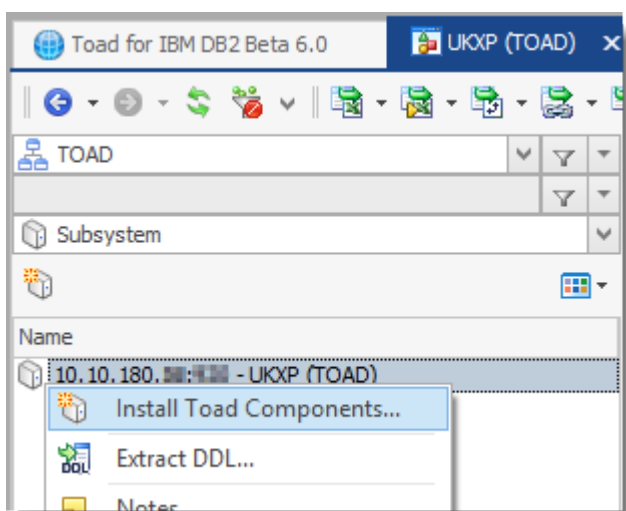
1. In Toad for IBM DB2, click  in the Toad toolbar.
2. Click  in the Connections window to launch the Client Configuration wizard.
3. For instructions on how to catalog the DB2 subsystem, press F1.

Install Toad IBM DB2 z/OS Components

Follow these instructions to install Toad IBM DB2 z/OS Components on your IBM DB2 subsystem:

Note: Toad for z/OS IBM DB2 Components version number has been updated to 6.0 to reflect changes connected with the installation wizard. If you have version 5.1 previously installed on you z/OS subsystems you can carry on using them and do not need to re-install.

1. Connect to DB2 z/OS database.
2. Right-click the subsystem you want to install the components on and select **Install Toad Components**.



3. Complete the **Specify the z/OS DB2 Subsystem** page. Identify the subsystem on which you are installing the z/OS components. Review the following for additional information:

| Field | Description |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subsystem ID | Enter the SSID for the DB2 subsystem on which you are installing the z/OS components. This should be the actual SSID, not an alias, for the subsystem. |
| User ID | Enter your User ID. |
| Password | Enter your password. |
| DB2 exit library | Enter the fully qualified name of the DB2 exit library. |
| DB2 load library | Enter the fully qualified name of the DB2 load library. |

4. Complete the **Specify Workload Manager (WLM) Environments for Toad** page.

Provide the names of the single-tasking and the multi-tasking WLM application environments used by IBM DB2 stored procedures and functions (These procedures and functions, in turn, are used by Toad for DB2). You can enter up to 32 characters for application environment names.

Notes:

- The two WLM application environments you specify must be reserved for exclusive use by Toad products, such as Toad for IBM DB2. Do not attempt to specify pre-existing WLM environments that are used for other applications.
 - The wizard allows up to 32 characters for an application environment name.
 - The multi-tasking WLM application environment must have at least 2 TCBs.
5. Complete the **Provide Parameters for Creating the Toad Database** page. Enter the following information to create the database required by the z/OS components. This database is created in the subsystem where you are installing the z/OS components.

Note: This database must be reserved for exclusive use by Toad DB2 products, such as Toad for IBM DB2.

| Field | Description |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Storage group | Enter the name of the storage group for the database objects. |
| Tablespace bufferpool | Enter the name of the bufferpool for tablespaces in the database. |
| Index bufferpool | Enter the name of the bufferpool for the indexes in the database. |
| DB2 CLI collection ID | Specify the identifier of the collection used when the DB2 installation job DSNTIJCL was run. If you do not know this collection ID, consult your systems programmer. |
| DB2 CLI plan name | Specify the name of the plan used when the DB2 installation job DSNTIJCL was run. If you do not know the plan name, consult your systems programmer. |

6. Complete the **Specify High Level Qualifiers (HLQs) for Toad z/OS Datasets** page. Provide the high-level qualifier for the temporary datasets on the mainframe to which the installation files will be transferred initially and provide the high-level qualifier for the permanent location of the Toad IBM DB2 z/OS Components files once the installation JCL is executed on the mainframe.
7. Complete the **Customize the JCL Job Card** page. Edit it according to the z/OS remote server.
8. Complete the **Customize Files for Transfer to the z/OS Subsystem** page. Enter the local path and directory where you want the installation process to generate and temporarily store customized installation files on the Toad client machine.
9. **Review Customization Results** on the following page.
10. Complete the **Transfer Toad Files to the z/OS Server** page. Enter the IP address of the Target Server and click Next.

Note:

- You can skip the FTP transfer and transfer the files manually.
11. Complete the **FTP Sign-on** page. Review the following for additional information:

| Field | Description |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FTP Connection | Select the FTP connection from the list. |
| Server address | Enter the IP address to which the files are transferred. |
| Server port | Enter the server port. |
| Username | Enter the mainframe user ID under which FTP transfers the files from the local directory on the Toad client machine to the temporary location on the mainframe. |
| Password | Enter the password associated with this user ID. |

12. **Review FTP Results** on the following page.
13. On the **Review Finishing Installation Tasks** page, review the README file stored in the local directory specified for the file transfer. This README file contains instructions for the additional tasks that must be performed on the mainframe to complete the z/OS components installation.
14. When a user is connected to DB2 Z/OS V13 and performs the **Install Toad Components** operation from the Subsystem object available in the Object Explorer, two scripts are generated. One of these scripts is named INSTDDL. The user needs to add the following statement at the top of the script:

```
SET CURRENT APPLICATION COMPATIBILITY = 'V12R1M503';
```

Why Manually Transfer the Installation Files?

The Toad IBM DB2 z/OS Components Installation wizard uses the default Windows FTP program to transfer the z/OS components installation files automatically from your Toad client machine to temporary datasets on the mainframe. However, you might need to transfer these files yourself for various reasons, such as:

- Windows FTP is not available.
- The wizard's attempt to transfer the files failed.
- You selected the **Do not FTP files to the mainframe** option in the wizard.

Perform the Transfer Manually

The process of manually transferring the z/OS components installation files from the Toad client machine to the mainframe involves two main tasks:

- Manually allocating four temporary datasets on the mainframe
- Populating these datasets using a normal 3270 emulation product that supports TSO `IND$FILE` transfer

To transfer the z/OS components installation files manually

1. Using ISPF option 3.2, allocate the following datasets on the mainframe, where *temphlq* is the temporary high-level qualifier for the datasets:

| Dataset | Type | Allocation Specifications |
|-------------------------|------------|--------------------------------------------------------------|
| <i>temphlq</i> .LOADXMI | Sequential | recfm=fb, recsize=80, blksize=3120, space=(cyl, (25, 15)) |
| <i>temphlq</i> .QCINST | Sequential | recfm=fb, recsize=80, blksize=3120, space=(trk, (10, 5)) |
| <i>temphlq</i> .JCLLIB | PDS | recfm=fb, recsize=80, blksize=3120, space=(trk, (10, 10, 5)) |
| <i>temphlq</i> .QSMSG | Sequential | recfm=vb, recsize=1028, blksize=6144, space=(trk, (10, 10)) |

Note: *temphlq*.JCLLIB must be a partitioned dataset.

2. Use `IND$FILE` in binary mode to transfer the file `QuestDB2product_install\plugins\db2\zos\loadlib.xmi` to *temphlq*.LOADXMI.

Note: The `QuestDB2product_install` value is the directory where the Toad for DB2 client (or another Toad IBM DB2 product) is installed on your Windows machine. The *temphlq* value is the high-level qualifier for the temporary mainframe datasets you allocated. References to these variables are also found in steps that follow.

3. Use `IND$FILE` in ASCII mode to transfer the file `QuestDB2product_install\plugins\db2\zos\qs.msg` to *temphlq*.QSMSG.
4. Use `IND$FILE` in ASCII mode to transfer the following files from `temp_local_directory\subsystem_id` on your Toad client machine to the appropriate members of *temphlq*.JCLLIB.

Note: `temp_local_directory` is the value you provided for **Temporary local directory** in the wizard to identify the temporary staging location for certain customized installation files on the Windows machine. The `subsystem_id` value is the SSID you specified in the wizard to identify the IBM DB2 subsystem on which you installing the z/OS components. The *temphlq* is the high-level qualifier for the temporary mainframe datasets you allocated. References to these variables are also found in steps that follow.

| Windows File Name | Dataset Member Name |
|-------------------|----------------------------------|
| QPDSNAT | <i>temphlq</i> .JCLLIB (QPDSNAT) |

| Windows File Name | Dataset Member Name |
|--------------------------------------------|------------------------------------------------------------|
| QCIVP | <i>tempqlq.JCLLIB(QCIVP)</i> |
| <i>single_tasking_WLM_environment_name</i> | <i>tempqlq.JCLLIB(single_tasking_WLM_environment_name)</i> |
| <i>multi-tasking_WLM_environment_name</i> | <i>tempqlq.JCLLIB(multi-tasking_WLM_environment_name)</i> |

Note: *single_tasking_WLM_environment_name* and *multi-tasking_environment_name* are the names of the WLM environments you specified in the wizard.

5. Use `IND$FILE` in ASCII mode to transfer the file `temp_local_directory\subsystem_id\QCINST` to `tempqlq.QCINST`.
6. On the mainframe, run `tempqlq.QCINST`. Use the instructions explained in the README file (located in `temp_local_directory\subsystem_id` or in `QuestDB2product_install\plugins\db2\zos`) to complete the installation process.

The Toad IBM DB2 z/OS Components installation creates the following objects on the mainframe.

Mainframe Objects

The z/OS components installation creates the following mainframe objects on your z/OS system. You need these objects to enable full Toad for IBM DB2 functionality for your IBM DB2 subsystem.

Note: The *permhlq* value is the high-level qualifier for the permanent datasets created by the installation.

| Object | Location on the Mainframe |
|---------------------------|---------------------------|
| Single-task WLM procedure | SYSTEM.PROCLIB |
| Multi-task WLM procedure | SYSTEM.PROCLIB |
| QPDSNAT procedure | SYSTEM.PROCLIB |
| Quest message file | <i>permhlq</i> .QSMMSG |
| Quest load library | <i>permhlq</i> .LOADLIB |

IBM DB2 Objects

The installation process creates the following IBM DB2 for z/OS objects:

| Object Type | Object Name |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Database | QCDB |
| Tablespace | QCBLUEPT, QCJFITS, QCTEMPLT, QCUTLIN, QCUTLOUT |
| Table | QUEST.QCBLUEPT_REPO030, QUEST.QCBLUEPT_STMT030, QUEST.QCJFI300_INPUT, QUEST.QCJFI300_OUTPUT, QUEST.QCTEMPLATE_REPO200, QUEST.QCUTL200_OUTPUT, QUEST.QCUTL200_TEMPLATES |
| Index | QUEST.QCBLUEPT_REPO030, QUEST.QCBLUEPT_STMT030, QUEST.QCTEMPLATE_REPO200 |
| Function | QUEST.QC200CHECKPDS, QUEST.QC200COMMAND, QUEST.QC200DSVOLSTATS, QUEST.QC200GETVOLUMEINFO, QUEST.QC200LISTMEMBER, QUEST.QC200STOGROUPVOLS, QUEST.QC200SUBSYSINFO, QUEST.QC200ZPARM, QUEST.QCVER, QUEST.QC200DSNCOMMAND, QUEST.QC202DSVOLSTATS, QUEST.QCAUTH, QUEST.QC204DSVOLSTATS |
| Procedure | QUEST.QC200EXECUTE_UTIL, QUEST.QC200SQLMSG, QUEST.QC300JFI, QUEST.QC450RETHLQ |
| Global Temp Table | QUEST.QC_UTILOBJ |
| Schema | QUEST |

This appendix describes how to customize the installation verification program QCIVP.

Purpose of QCIVP

After the Toad IBM DB2 z/OS Components Installation wizard finishes its tasks, you must perform additional tasks on the mainframe to complete the installation. The last of these mainframe tasks is to run `QCIVP`, a mainframe installation verification program. `QCIVP` verifies that the IBM DB2 CLI has been installed and bound. It also runs a sample of the components's procedures and functions and then writes the output to the `QSPRINT` message file.

Where QCIVP Resides

The dataset member `permhlq.JCLLIB(QCIVP)` contains the JCL for running `QCIVP`. This dataset is created during the z/OS components installation process you perform on the mainframe.

How to Run QCIVP

The instructions for running `QCIVP`, as well as for performing all other tasks required to complete the installation on the mainframe, are found in the `README` file for the Toad IBM DB2 z/OS Components installation. This `README` file is found in either location:

- The `subsystem_ID` directory in the location you specified for **Temporary Local Directory** in the Toad IBM DB2 z/OS Components Installation wizard
- The `Plugins\DB2\ZOS` directory under your Toad for DB2 installation directory.

Reasons for Editing QCIVP

Before running `QCIVP`, you might need to edit the program if any of the following situations is valid:

- You want to enable application tracing while `QCIVP` is running so that a series of trace messages are written to a user-supplied file for every call to a CLI function for that job.
- In situations where two or more DB2 subsystems share the same exit library (and therefore share a common `DSNHDECP` member in the library), the default subsystem ID in `DSNHDECP` matches one of the subsystem IDs, but not the others. You need a mechanism for providing the correct IBM DB2 subsystem ID for connection to the subsystems whose IDs do not match the default SSID in `DSNHDECP`. You can accomplish this by coding a `DSNAOINI` override in `QCIVP`.

Edit QCIVP

Use the appropriate procedure to edit QCIVP:

- Turn on application tracing. See "Enable Application Tracing" on page 15 for more information.
- Turn off application tracing. See "Disable Application Tracing" on page 16 for more information.
- Turn on application tracing and change the default IBM DB2 SSID. See "Enable Application Tracing and Change the Default DB2 SSID" on page 16 for more information.
- Change the default IBM DB2 SSID without turning on application tracing. See "Change the Default DB2 SSID Without Enabling Application Tracing" on page 17 for more information.

Enable Application Tracing

Use the following procedure to edit QCIVP to enable application tracing for the duration of the QCIVP job.

Note: Enabling tracing for QCIVP does not affect the long-term results obtained from the WLM procedures.

To enable application tracing

1. Open *permhlq.JCLLIB(QCIVP)* in an ISPF EDIT session (where *permhlq* is the high-level qualifier for the permanent location where the z/OS component was installed).
2. Type `NUM OFF` at the EDIT session command line to turn off sequence numbering.

Note: If you fail to turn sequence numbering off, errors can occur. Be aware that you might need to turn sequence numbering off each time you edit QCIVP.

3. Add the following cards to QCIVP:

```
//APPTRC DD SYSOUT=*  
//DSNAOINI DD *  
#Turn on application tracing  
[COMMON]  
APPLTRACE=1  
APPLTRACEFILENAME="DD:APPTRC"  
/**
```

4. Save your changes to QCIVP.
5. Exit the ISPF EDIT session.
6. Confirm that sequence numbering is truly turned off by opening *permhlq.JCLLIB(QCIVP)* in another ISPF EDIT session. There should be no sequence numbers in columns 73-80 for lines appearing between `//DSNAOINI` and the `/**` line.
7. Confirm that your square brackets translated correctly:
 - a. Type `FIND X 'AD' ALL` in the command line, and press Enter.
 - b. Make sure the `FIND` command locates all the left brackets.
 - c. Type `FIND X 'BD' ALL` in the command line, and press Enter.

- d. Make sure the `FIND` command locates all right brackets.
 - e. If `FIND` failed to located even one bracket, type `HEX ON` in the command line, press Enter, and then make the appropriate edits in `HEX` mode.
8. Save your changes to `QCIVP`.

Disable Application Tracing

Use the following procedure to edit `QCIVP` to disable application tracing for the duration of the `QCIVP` job.

To disable application tracing

1. Open `permhlq.JCLLIB(QCIVP)` in an ISPF EDIT session (where `permhlq` is the high-level qualifier for the permanent location where the z/OS component was installed).
2. Type `NUM OFF` at the EDIT session command line to turn off sequence numbering.

Note: If you fail to turn sequence numbering off, errors can occur. Be aware that you might need to turn sequence numbering off each time you edit `QCIVP`.
3. Edit the following card to set `APPLTRACE` to zero, as shown in the following figure:

```
//APPTRC DD SYSOUT=*
//DSNAOINI DD *
#Turn on application tracing
[COMMON]
APPLTRACE=0
APPLTRACEFILENAME="DD:APPTRC"
/*
```

4. Save your changes to `QCIVP`.
5. Exit the ISPF EDIT session.
6. Confirm that sequence numbering is truly turned off by opening `permhlq.JCLLIB(QCIVP)` in another ISPF EDIT session. There should be no sequence numbers in columns 73-80 for lines appearing between `//DSNAOINI` and the `//*` line.
7. Confirm that your square brackets translated correctly:
 - a. Type `FIND X 'AD' ALL` in the command line, and press Enter.
 - b. Make sure the `FIND` command locates all the left brackets.
 - c. Type `FIND X 'BD' ALL` in the command line, and press Enter.
 - d. Make sure the `FIND` command locates all right brackets.
 - e. If `FIND` failed to located even one bracket, type `HEX ON` in the command line, press Enter, and then make the appropriate edits in `HEX` mode.
8. Save your changes to `QCIVP`.

Enable Application Tracing and Change the Default DB2 SSID

Use the following procedure both to enable application tracing and to change the IBM DB2 SSID from the default value in the `DSNHDECP` to the actual IBM DB2 SSID for the subsystem on which you are installing the z/OS components.

To enable application tracing and change the default IBM DB2 SSID

1. Open *permhlq.JCLLIB(QCIVP)* in an ISPF EDIT session (where *permhlq* is the high-level qualifier for the permanent location where the z/OS component was installed).
2. Type *NUM OFF* at the EDIT session command line to turn off sequence numbering.

Note: If you fail to turn sequence numbering off, errors can occur. Be aware that you might need to turn sequence numbering off each time you edit *QCIVP*.

3. Add the following cards to *QCIVP*, replacing all occurrences of *XXXX* with the appropriate non-default DB2 SSID:

```
//APPTRC DD SYSOUT=*
//DSNAOINI DD *
#Turn on application tracing and change default DB2 SSID
#Change each occurrence of XXXX to the actual DB2 SSID
#Change plan name if CLI plan is not DSNACLI
[COMMON]
MVSDEFAULTSSID=XXXX
APPLTRACE=1
APPLTRACEFILENAME="DD:APPTRC"
[XXXX]
MVSATTACHTYPE=CAF
PLANNAME=DSNACLI
//*
```

4. Save your changes to *QCIVP*.
5. Exit the ISPF EDIT session.
6. Confirm that sequence numbering is truly turned off by opening *permhlq.JCLLIB(QCIVP)* in another ISPF EDIT session. There should be no sequence numbers in columns 73-80 for lines appearing between *//DSNAOINI* and the *//** line.
7. Confirm that your square brackets translated correctly:
 - a. Type *FIND X 'AD' ALL* in the command line, and press Enter.
 - b. Make sure the *FIND* command locates all the left brackets.
 - c. Type *FIND X 'BD' ALL* in the command line, and press Enter.
 - d. Make sure the *FIND* command locates all right brackets.
 - e. If *FIND* failed to located even one bracket, type *HEX ON* in the command line, press Enter, and then make the appropriate edits in *HEX* mode.
8. Save your changes to *QCIVP*.

Change the Default DB2 SSID Without Enabling Application Tracing

Use the following procedure to change the IBM DB2 SSID from the default value in the *DSNHDECP* to the actual IBM DB2 SSID for your subsystem without enabling application tracing.

To change the default DB2 SSID without enabling application tracing

1. Open *permhlq.JCLLIB(QCIVP)* in an ISPF EDIT session (where *permhlq* is the high-level qualifier for the permanent location where the z/OS component was installed).
2. Type *NUM OFF* at the EDIT session command line to turn off sequence numbering.

Note: If you fail to turn sequence numbering off, errors can occur. Be aware that you might need to turn sequence numbering off each time you edit `QCIVP`.

3. Add the following cards to `QCIVP`, replacing all occurrences of `XXXX` with the appropriate non-default DB2 SSID:

```
//APPTRC DD SYSOUT=*
//DSNAOINI DD *
#Change default DB2 SSID
#Change each occurrence of XXXX to the actual DB2 SSID
#Change plan name if CLI plan is not DSNACLI
[COMMON]
MVSDEFAULTSSID=XXXX
[XXXX]
MVSATTACHTYPE=CAF
PLANNAME=DSNACLI
CC/*
```

4. Save your changes to `QCIVP`.
5. Exit the ISPF EDIT session.
6. Confirm that sequence numbering is truly turned off by opening `permhlq.JCLLIB(QCIVP)` in another ISPF EDIT session. There should be no sequence numbers in columns 73-80 for lines appearing between `//DSNAOINI` and the `//*` line.
7. Confirm that your square brackets translated correctly:
 - a. Type `FIND X 'AD' ALL` in the command line, and press Enter.
 - b. Make sure the `FIND` command locates all the left brackets.
 - c. Type `FIND X 'BD' ALL` in the command line, and press Enter.
 - d. Make sure the `FIND` command locates all right brackets.
 - e. If `FIND` failed to located even one bracket, type `HEX ON` in the command line, press Enter, and then make the appropriate edits in `HEX` mode.
8. Save your changes to `QCIVP`.

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A

application tracing

- disable 16
- enable 15-16

C

catalog IBM DB2 subsystem 4

D

DB2 objects created by installation 12
default SSID in DSNHDECP, change 16-17

I

installation

- install process 5
- objects created 10
- pre-installation tasks 4
- privileges required 3
- software requirements
 - mainframe 2
 - WLM 3

M

mainframe objects created by installation 11

O

objects created by the installation

- IBM DB2 12
- mainframe 11

P

performance requirement 3
privileges required for z/OS Component

- for installing 3
- for running 3

Q

QCIVP

- about 13
- edit
 - to change default SSID 16-17
 - to disable application tracing 16
 - to enable application tracing 15-16

R

requirements

- mainframe 2
- software 2
- WLM 3

S

software requirements 2

system requirements

- mainframe 2
- software 2
- WLM 3

T

transfer installation files

- manually 8

Z

z/OS components

- edit QCIVP 13
- installation 5
- installation requirements 2
- manual transfer of installation files 8
- objects created by installation 10
- pre-installation tasks 4
- privileges required 3

purpose 2