

# **TurboTuneSQL FOR DB2**

VERSION 12.0

## **INSTALLATION GUIDE**

Installation Guide Manual

### **Preface**

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## **Related Documents**

Related documents:

- TurboTuneSQL-User Guide
- TurboTuneSQL-Installation Guide
- TurboTuneSQL-VIRT User Guide
- TurboTuneSQL-Messages Guide

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# Chapter 1. Introduction

This manual will guide you through the installation of TurboTuneSQL for DB2.

TurboTuneSQL for DB2 (or TurboTuneSQL) is one of the most complete solutions available on the market to monitor and discover performance problems in DB2 z/OS applications. It allows you to analyze and monitor your entire DB2 Workload instead of monitoring specific applications only.

This product gives you the most accurate and complete methods to improve the performance of all DB2 applications and reduce the consumption of important Mainframe resources.

TurboTuneSQL for DB2 is composed by:

- Publications:
  - TurboTuneSQL-User Guide
  - TurboTuneSQL-Installation Guide
  - TurboTuneSQL-VIRT User Guide
  - TurboTuneSQL-Messages Guide
- Product data sets (distributed in XMIT format):
  - TTUNESQL.V120.INSTALL.REXX
  - TTUNESQL.V120.INSTALL.INST
  - TTUNESQL.V120.INSTALL.DATA

This manual is divided in several chapters:

[Chapter 1. Introduction \(present chapter\)](#)  
[Chapter 2. Installing TurboTuneSQL](#)  
[Chapter 3. IVP \(Installation Verification Procedure\)](#)  
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## 1.1 - Installation Requirements and Considerations

### Requirements:

- DB2 V11, V12
- z/OS V2.10 or later
- TSO/E
  - DB2 LOAD libraries must be at DDNAME STEPLIB/ISPLLIB in TSO procedures.
  - Language Environment must be at DDNAME STEPLIB/ISPLLIB in TSO procedures.
  - TSO region should have at least 8 MB memory.
  - TSO/E REXX
- SMF/GTF:
  - if you want to work with SMF to collect DB2 traces, SMF records types 101 and 102 must be active and being collected. This requirement is optional if you want to collect traces using GTF instead.
- DASD space:
  - Space necessary to install the product: 1000 tracks 3390 (or 7 cyls 3390).
  - Space necessary to run the product and create all DB2 objects: 65.500 tracks (3390 disk model). This allocation quantity may **widely** vary depending on the size of your DB2 installation.
  - DB2 Utilities Suite (or similar tool).

TurboTuneSQL BATCH functions make use of following DB2 Utilities functions: LOAD and RUNSTATS.

If you have a non-IBM LOAD utility from an independent ISV, you may need to manually customize all *JCL* and *sysins* automatically generated by TurboTuneSQL.

**Optional requirements if using feature TurboTuneSQL Automatic Index Recommendation:**

- Creation of virtual indexes:
  - DB2 must be update-to-date with the most recent IBM APARS related to Virtual Index Support.
- Execution of RUNSTATS:
  - TurboTuneSQL Automatic Index Recommendation can optionally execute RUNSTATS function using DB2 provided stored procedure: DSNUTILS. If you have a non-IBM RUNSTATS utility from an independent ISV, it must be compatible with DB2 DSNUTILS stored procedure.
- RACF access to FACILITY CLASS: TurboTuneSQL may use this RACF class to control the use of some options of TurboTuneSQL Automatic Index Recommendation Utility.

Others:

- DB2 Grant access to:
  - o Start DB2 Traces
  - o Create DB2 objects: Tables, Packages and Plan.
  - o *Select* Access to DB2 Catalog tables.
  - o Use DB2 Explain function.
- RACF access to update and create data sets provided by TurboTuneSQL product.
- Sort is required. DF/SORT or any other Sort Product may be used.
- FTP or other communication software to upload TurboTuneSQL installation files to the host.
- DSNTEP2
- TurboTuneSQL Password Generation: contact your local representative to generate a new password. In most cases, the machine CPU ID must be sent to your local contact. Related information is described in [Appendix A – Password Setup](#).

## **Requirements for TurboTuneSQL-VIRT:**

- The following DB2 supplied stored procedures must be active:
  - o SYSPROC.ADMIN\_COMMAND\_DB2
  - o SYSPROC.ADMIN\_INFO\_SYSPARM
- Profile monitoring must be enabled. DB2 sampling job DSNTIJOS can be used to create profile tables:
  - o SYSIBM.DSN\_PROFILE\_TABLE
  - o SYSIBM.DSN\_PROFILE\_HISTORY
  - o SYSIBM.DSN\_PROFILE\_ATTRIBUTES
  - o SYSIBM.DSN\_PROFILE\_ATTRIBUTES\_HISTORY
- DB2 Grants:
  - Users should have the following authorities: SYSADM, SYSOPR and SYSCTRL **or:**
    - o Authorities to create DB2 objects: Packages and Plan
    - o Use DB2 Explain function ( EXPLAIN or SQLADM or System DBADM authorities).
    - o Authority to execute SET CURRENT SQLID
    - o SELECT, DELETE, UPDATE access on PLAN TABLEs
    - o Select Access to DB2 Catalog tables (including SYSIBM.SYSDUMMY1)
    - o Grant execute on procedure:
      - TurboTuneSQL-VIRT Explain Stored Procedure: SADBEXST
      - SYSPROC.ADMIN\_COMMAND\_DB2
      - SYSPROC.ADMIN\_INFO\_SYSPARM
- FTP or other communication software to upload TurboTuneSQL-VIRT installation files to the host.
- DSNTDP2
- TurboTuneSQL-VIRT Password Generation: contact your local representative to generate a new password. In most cases, the machine CPU ID must be sent to your local contact. Related information is described in [Appendix A - Password Setup](#).

## **Optional requirements if using TurboTuneSQL GUI in Linux Ubuntu or Windows:**

- Linux Ubuntu 19.10 or later
- Windows 10 or later
- MySQL Server version: 5.7.28-0 for Ubuntu or later
- MySQL Server version: 8.0.18 for Windows or later

## Chapter 2. Installing TurboTuneSQL

This chapter will guide you to install the product. The general steps are:

- Library allocation
- Upload product files
- Execute installation REXX

### 2.1 - Allocation of XMIT temporary datasets

Allocated three (3) datasets to transfer the XMIT files.

The format of the XMIT data sets is RECFM=FB, LRECL=80, BLKSIZE=3120.

**<HLQTEMP>**.REXX must be allocated with 30 Tracks.

**<HLQTEMP>**.INST must be allocated with 30 Tracks.

**<HLQTEMP>**.DATA must be allocated with 2500 Tracks.

Sample JCL to allocate the files:

```
//JOB CARD
//*
//*-----*
//* ALLOCATE INSTALL DATASETS          *
//*                                  *
//* SUBSTITUTE:<HLQTEMP> to your HLQ *
//*          VOL1 to your VOLUME      *
//*-----*
//*
//IEFBR14 EXEC PGM=IEFBR14
//DD01 DD DISP=(,CATLG,DELETE),UNIT=SYSDA,
// SPACE=(TRK,(30,10)),VOL=SER=VOL1,
// LRECL=80,BLKSIZE=3120,RECFM=FB,
// DSN=<HLQTEMP>.REXX
//*
//DD02 DD DISP=(,CATLG,DELETE),UNIT=SYSDA,
// SPACE=(TRK,(30,10)),VOL=SER=VOL2,
// LRECL=80,BLKSIZE=3120,RECFM=FB,
// DSN=<HLQTEMP>.INST
//*
//DD03 DD DISP=(,CATLG,DELETE),UNIT=SYSDA,
// SPACE=(TRK,(2500,10)),VOL=SER=VOL3,
// LRECL=80,BLKSIZE=3120,RECFM=FB,
// DSN=<HLQTEMP>.DATA
//*
```

## 2.2 - Upload the 3 XMIT files to Host

- Transfer file TTSQL.REXX, TTSQL.INST and TTSQL.DATA using FTP (or other communication software) using *binary transfer mode* to Mainframe.
- Go to TSO option 6 and execute the following command:  
TSO EX '<HLQTEMP>.REXX' '<HLQTEMP>.INST <HLQTEMP>.DATA'

**Attention:** You will need to execute the above command for each Db2 you intend to install the product.

If you have DB2 DataSharing, you will need to execute the REXX only once in any DB2 member.

The first screen will be displayed after you execute the installation REXX:

```
TurboTuneSQL-V120      Installation                      (1-11)
COMMAND ===>

  DB2 Specifications

  DB2 SYSTEM   : DBBG          STOGROUP: ADVSTG
  VCAT         : DSNCB10      VOLUME   : *

  Buffer Pools: BP1           (For Tablespaces)
                : BP2         (For Indexspaces)
                : BP32K       (Inform a 32K buffer pool)

  Tablespaces size: G   (S=Small,M=Medium,L=Large,G=Giant)

  Create new Storage Group?  N (Yes/No/Recreate)

                                <PF3>=exit  <ENTER>=next
```

Inform all the fields necessary for each screen and hit <ENTER>.

After the last screen, there will be a confirmation and the product will be installed automatically.

The explanation for each field is obtained by pressing F1 on each screen.

### Fields:

#### **DB2 SYSTEM**

DB2 SSID where product will be installed.

#### **STOGROUP**

Specify a DB2 storage group where product will be installed.

#### **VCAT**

In case you want to create a new DB2 storage group, specify a high-level qualifier.  
Not mandatory.



**VOLUME**

Specify a volume if VCAT is not SMS. For SMS inform "\*" instead.

**Buffer Pools**

Buffer Pool for product tablespaces and Buffer Pool for indexspaces.  
A 32K buffer must be also specified.

**Tablespaces size**

Inform:

- G if you plan to have very large tablespace.
- L if you plan to have large tablespaces
- M if you plan to have medium tablespaces
- S if you plan to have small tablespaces

**Create new storage group?**

Inform:

- "Y" if this storage group is new.
- "N" if this storage group already exists
- "R" if you want to drop and create the storage group.

**DB Name**

Specify a DB2 database name where product will be installed.

**Plan name**

Specify a DB2 plan name to be used by product.

**Qualifier**

Qualifier for product tables and indexes.

**Bind User**

User id to be used as OWNER of TurboTuneSQL packages and plan.

**Collection**

Specify a DB2 collection name to be used by product.

**Bind User ID**

User id to be used as OWNER of TurboTuneSQL packages and plan.

**DECP DYNRULES:**

TurboTuneSQL force DECP rules. Valid values are Y or N:

Y - TurboTuneSQL preprocessor will be forced to use DECP COMMA and DECP QUOTE as specified here

N - TurboTuneSQL preprocessor will respect DB2 precompile.

For more details about this option, refer to TurboTuneSQL USER GUIDE, 'Customize a TurboTuneSQL Profile'.

**DECP COMMA**

TurboTuneSQL preprocessor period or comma.

Valid only if DECP DYNRULES is Y or if want to load SQL from SQLs Cache Area:

N - Means PERIOD is being used

Y - Means COMMA is being used

**DECP QUOTE**

TurboTuneSQL preprocessor APOST or quote.

Valid only if DECP DYNRULES is Y or if want to load SQLs from SQL Cache Area:

N - Means that APOST is being used

Y - Means that QUOTE is being used

**DB2 CCSID UNICODE**

DB2 CCSID UNICODE. This value can be found in the DSNHDECP Module, field **USCCSID**.

**Very important:** IBM recommends to set the value to 00367. This field should not be changed.

**DB2 CCSID EBCDIC**

DB2 CCSID EBCDIC value. This value can be found in the DSNHDECP module, field **SCCSID**.

In order to avoid Unicode x EBCDIC conversion problems, please inform the correct CCSID value in this field.

**DECP DYNRULES:**

TurboTuneSQL force DECP rules. Valid values are Y or N:

Y - TurboTuneSQL preprocessor will be forced to use DECP COMMA and DECP QUOTE as specified here

N - TurboTuneSQL preprocessor will respect DB2 precompile.

For more details about this option, refer to TurboTuneSQL USER GUIDE, 'Customize a TurboTuneSQL Profile'.

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TurboTuneSQL preprocessor APOST or quote.

Valid only if DECP DYNRULES is Y or if want to load SQLs from SQL Cache Area:

N - Means that APOST is being used

Y - Means that QUOTE is being used

**SDSNEXIT**

DB2 SDSNEXIT data set name

**SDSNLOAD**

DB2 SDSNLOAD data set name

**RUNLIB**

DB2 RUNLIB data set name

**DSNTEP2**

DSNTEP2 DB2 plan name

**DSNTIAUL PLAN**

DSNTIAUL DB2 plan name

**DSNTIAUL PROG**

DSNTIAUL DB2 program name

**Db2 Explain and Remote Access (optional)**

Optional customization: Set up TurboTuneSQL Explain Components and creation of remote DB2 Plan.

**WLM Environment for Explain Stored Procedure:**

If you want to use TurboTuneSQL Explain Stored Procedure, set here a WLM Application Environment where the procedure will be executed. If using an existing WLM Application Environment, we recommend you to use NUMTCB=1.

Installation Job INST34SP will be created.

Note: After you have executed this installation CLIST, a sample PROC with JCL required to execute TurboTuneSQL Stored Procedure will be created with the name **WLMSAMPL**.

**Avoid authorization errors in Explain for:**

DB2 V10 has implemented new explain authorities: EXPLAIN, SQLADM and SYSTEM DBADM authorities (check IBM DB2 documentation for more information). If you want to explore this new facility, this **configuration step can be ignored**.

However, if you don't want to explore this new DB2 facility, follow below steps.

If you want to allow any user to execute DB2 Explain function without the need of having the same authority required by DB2 in order to execute the command being explained, just type 'Y' to select a TurboTuneSQL explain component where you want to bypass this authority:

- Batch Explain and Index Recommendation Utility
- Online Explain Utility
- Explain Stored Procedure

Notes:

- 1) When activating this feature, DB2 authority will NOT be checked against DB2 PLAN TABLES chosen by users. But DB2 security to execute command *SQL Set Current SQLID* will still be verified.
- 2) A SYSADM user will be necessary to execute Bind.
- 3) Bind option DYNAMICRULES(BIND) will be used.
- 4) Job **INST33BE** will be created.

**Access using remote DB2 Plan:**

If you want to access TurboTuneSQL tables remotely, a BIND with option DRDA can be created in installation process. If you want to created this job, please choose:

New remote plan name: DB2 Plan name (do not use same Plan name as specified before).

Remote DB2 Location: DB2 DRDA remote location.

Installation Job INST27BR will be created.

**UTILITY PROGRAM**

LOAD Utility Program Name (IBM and non-IBM)

IBM default utility is **DSNUTILB**.

BMC default utility is **AMUUMAIN**.

CDB default utility is **CDBUTIL**.

**PARAMETERS (NON-IBM)**

Enter parameters below only if the utility is different from DSNUTILB (IBM).

**UTILITY PARM**

Parameter to be used in the parm jcl keyword.

**LOAD LIBRARY 1**

Load Library to be used in STEPLIB.

**LOAD LIBRARY 2**

Load Library to be used in STEPLIB.

**ISPF libraries****Panels** - example: ISP.SISPPENU**Tables** - example: ISP.SISPTENU**Messages** - example: ISP.SISPMENU**CEERUN**

Language Environment CEERUN data set.

**High Level Qualifier**

Product installation hlq for target datasets.

**Volume**

Product installation volume for target datasets. If datasets are SMS managed the volume will be ignored.

**Create target datasets?**

Inform: "Y" to create new target datasets

"R" to replace existing target datasets

"C" to configure new Db2 SSID. Installation will use existing target datasets and only SAMPLIB, PROFILE and SADVCLST will be created for the new Db2 SSID.

**HLQ used in work data sets:**

This HLQ will prefix all work data sets during execution of TurboTuneSQL.

**HLQ used to backup tablespaces**

This HLQ will be used in a sample job to backup TurboTuneSQL tablespaces.

&lt;Target HLQ&gt;.SAMPLIB(J000BTSP)

**JOB Cards**

Jobcard for all installation jobs.

**2.3 - SAMPLIB(INST34SP): Create TurboTuneSQL-VIRT Explain Stored Procedure (optional)****If you want to execute TurboTuneSQL-VIRT explain function using TurboTuneSQL-VIRT Explain Stored Procedure, execute this job.**

If you wish to give grant execute authority in the above DB2 Stored procedure, follow model in PHASE 4 of job INST05GR after have executed this job.

Note: a sample PROC with JCL required to execute TurboTuneSQL-VIRT Stored Procedure was create with name **WLMSAMPL** (we recommend you to use NUMTCB=1)**2.4 - Execute IVP**

TurboTuneSQL is now installed. We strongly recommend you to execute IVP (installation verification procedure) to verify that TurboTuneSQL has been successfully installed.

Please, go to [Chapter 3](#) for more information.

## Chapter 3. Initial Verification Procedure (IVP)

This chapter will guide you to run the Installation Verification Procedure (IVP) in order to verify that TurboTuneSQL has been successfully installed.

**We strongly recommend** that you execute IVP installation step because TurboTuneSQL tables, as any other DB2 application tables, must be populated with data before the execution of DB2 RUNSTATS utility and DB2 Bind command to **avoid performance problems**. This will guarantee that DB2 will choose the best access path for all TurboTuneSQL programs.

TurboTuneSQL IVP procedure is composed by a single DBRM data set and a small SMF data set with DB2 traces previously collected (SMF types 101 and 102).

Please follow these steps to execute IVP:

### 3.1 - Create IVP DB2 tables

Edit *product installation data set* as informed in Chapter 1.

Submit the following jobs:

#### 3.1.1 - SAMPLIB(INST90I1) (mandatory)

This job will create TurboTuneSQL IVP tablespaces and tables.

#### 3.1.2 - SAMPLIB(INST90I2) (mandatory)

This job will run DB2 RUNSTATS against TurboTuneSQL IVP Tables.

NOTE: Users with NON-IBM utilities should change this JCL as needed.

Example:

RUNSTATS for BMC users should use EXEC PGM=ASUUMAIN

#### 3.1.3 - Run IVP jobs from SAMPLIB (mandatory)

Submit these jobs in the sequence below from SAMPLIB to load IVP data into TurboTuneSQL:

```
INST91LG
INST92IT
INST93SM
INST94DB
INST95ST
INST96OB
INST97SR
INST98EX
```

#### 3.1.4 - RUNSTATS SAMPLIB(J000RNST)

Run RUNSTATS to update statistics for TurboTuneSQL database.

#### 3.1.5 - REBIND SAMPLIB(J000REBI)

Run REBIND to update access path for all TurboTuneSQL programs.

**Note:**

You do not need to change any IVP parameter (OPTION E) because all configuration parameters should be ready to execute TurboTuneSQL IVP.

**Very important:** do not change UNICODE number in this profile because the IVP will not run successfully. In order to successfully execute IVP you must maintain the same UNICODE number from where IVP traces and DBRMs that were previously created. **BUT** after have executed IVP, please correct UNICODE number to the right value.

### 3.2 - Backup product tablespaces

If you want to backup TurboTuneSQL tablespaces, you can Edit and submit job: *<product installation data set>SAMPLIB(J000BTSP)*.

NOTE: user with NON-IBM utilities should change this jcl as need. Example: 'COPY TABLESPACE' for BMC users should use EXEC PGM=ACPMMAIN

### 3.3 - Reorganize your TurboTuneSQL Database

Recommended step. Edit and submit job: *<product installation data set>(J000REOR)*

**Attention:** this job is **mandatory** if you have changed the default sizes of TurboTuneSQL tablespaces (jobs: INST15TB / INST15TL / INST15TM / INST15TS), to really **increase** space allocations you need to execute job SAMPLIB(J000REOR).

NOTE: user with NON-IBM utilities should change this jcl as need. Example: 'REORG TABLESPACE' for BMC users should use EXEC PGM=ARUUMAIN

### 3.4 - RUNSTATS to update statistics for TurboTuneSQL Database

Edit and submit job: *<product installation data set>SAMPLIB(J000RNST)*

**Attention:** consider this job as **mandatory** to avoid performance problems when using TurboTuneSQL (online or batch).

NOTE: user with NON-IBM utilities should change this jcl as need. Example: 'RUNSTATS TABLESPACE' for BMC users should use EXEC PGM=ASUUMAIN

### 3.5 - REBIND TurboTuneSQL Packages

Edit and submit job: *<product installation data set>SAMPLIB(J000REBI)*

**Attention:** Consider this job as **mandatory** to avoid performance problems when using TurboTuneSQL (online or batch).

### 3.6 - Execute Online and Batch Reports

Now, you can navigate in TurboTuneSQL Online Screens in order to verify that TurboTuneSQL IVP has been loaded successfully.

Execute TurboTuneSQL Main CLIST:

```
TSO EX '<product installation data set>.SADVCLST(START)'
```

Navigation examples:

- Option 4.2 - Online Reports. Example: In Report ASSI, you will see a DB2 name DSN1. This is the DB2 where IVP was created.
- Option 4.3 - Batch Reports

For more details about Reports, refer to TurboTuneSQL USER GUIDE.

## Chapter 4. Installing TurboTuneSQL GUI

This chapter will guide you to install feature TurboTuneSQL GUI (Graphic User Interface) in Linux Ubuntu or Windows.

Please follow these steps to install TurboTuneSQL GUI in Linux Ubuntu:

### 4.1 - Linux Ubuntu

Unzip file TurboTuneSQL.zip to any folder. Example:

Download MySQL from internet or unzip our TurboTuneSQLMS.zip to any folder.

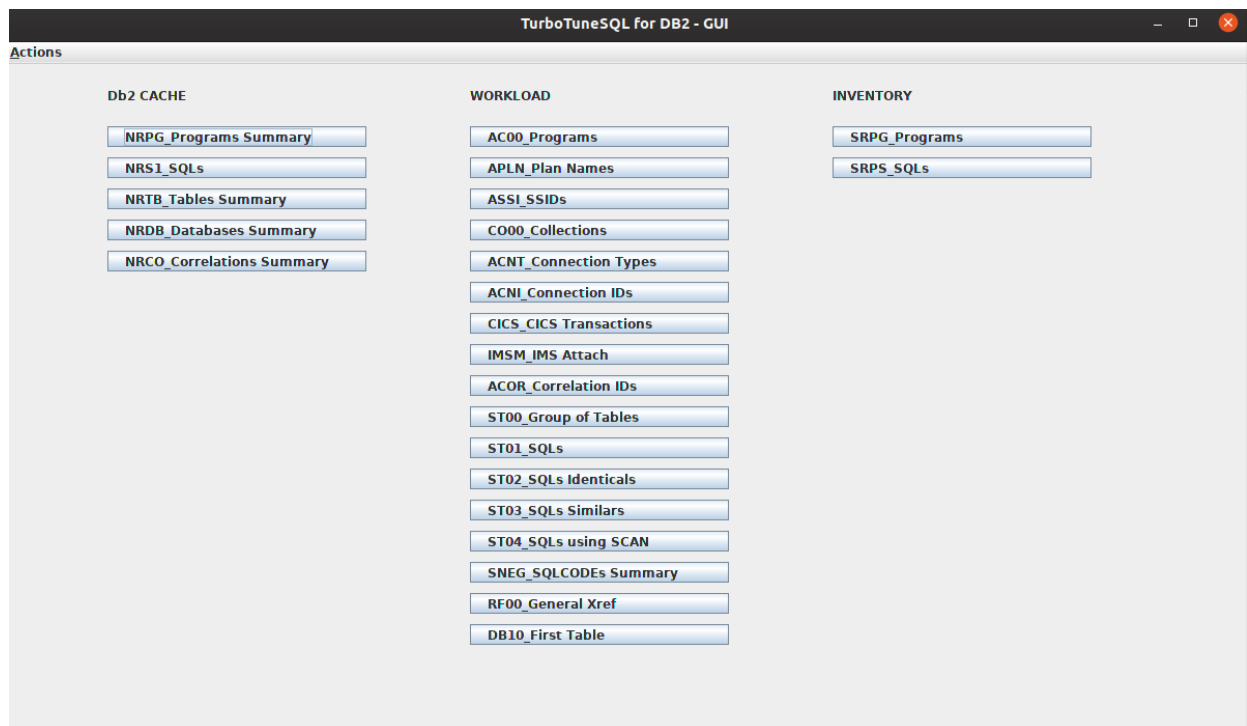
Create user tts and authorize....

Start first server. Open a terminal and execute: `java TurboTuneSQLServerC 9190`.  
Message "TurboTuneSQLServerC started" will be displayed.

Start second server. Open another terminal and execute: `java TurboTuneSQLServerG 9191`.  
Message "TurboTuneSQLServerG started" will be displayed.

Execute the Graphic user interface. Open another terminal and execute: `java TurboTuneSQLGUI`

The screen below will be displayed.





Please, refer to TurboTuneSQL User Guide for a description of each report.

## **4.2 - Windows**

Edit *product installation data set* as informed in Chapter 1.

Submit the following jobs:

## Appendix A. Password Setup

In order to set up a new password for TurboTuneSQL, you need to contact your local representative and send your Mainframe *CPU ID serial number* (the preferable method to get this information is to send the result of the “D M=CPU” MVS operator command).

For more information how to apply TurboTuneSQL license module, please consult TurboTuneSQL-Common Components General Information manual.

## **Appendix B. How to apply fixes to TurboTuneSQL**

TurboTuneSQL CHANGE is a set of software corrections (Fix) available to modify product libraries, like panels, skeletons, modules, etc.

For more information how to apply fixes to TurboTuneSQL, please consult TurboTuneSQL-User Guide.

## Contact

If you have any questions, concerns or comments, please contact your local representative.