

SOP: TaifaCare Server Optimization User Guide

[Last update: Aug 2025]

TASK:	Technical TaifaCare Server Optimization
OBJECTIVE:	To improve server performance by following some configuration steps
WHO:	Facility System Admin, Partner supporting site HIS staff
REQUIRED MATERIALS:	Functional TaifaCare

Background:

Many facilities, especially high-volume facilities, have reported EMR server performance issues when accessing their TaifaCare instance. Some of the performance issues reported include slow response when retrieving patient information, slow execution of reports and in some adverse cases, users experienced a lag while logging into the system. While some of these issues can be attributed to structural design of EMR, most of them are as result of misconfigurations in the EMR dependencies (Java, MySQL, Tomcat). This guide outlines the requisite configuration that may help improve your EMR performance for a better user experience.

Objective:

To outline various EMR configuration steps and checks that would result in better server performance.

SECTION 1: MYSQL CONFIGURATIONS

Sometimes MySQL instance does not pick the configurations that you saved in **my.cnf** file. This has been noted often on Ubuntu 20.04. Check to be sure all the configurations are properly set and are being picked up.

i. MySQL configurations

- Open Terminal
- Navigate to **mysql** directory and open the **my.cnf** file

You should be able to see the file as shown.

```
botienoh@botienoh: /etc/mysql
botienoh@botienoh:~$ cd /etc/mysql/
botienoh@botienoh:/etc/mysql$ ll
total 24
drwxr-xr-x  3 root root 4096 Aug  3 2021 ./
drwxr-xr-x 110 root root 4096 Feb  2 10:30 ../
drwxr-xr-x  2 root root 4096 Aug  3 2021 conf.d/
-rw-----  1 root root  333 Aug  3 2021 debian.cnf
-rwxr-xr-x  1 root root 1220 Mar 17 2014 debian-start*
lrwxrwxrwx  1 root root   24 Aug  3 2021 my.cnf -> /etc/alternatives/my.cnf
-rw-r--r--  1 root root  839 Aug  3 2016 my.cnf.fallback
botienoh@botienoh:/etc/mysql$
```

- ### ii. Backup a copy of my.cnf file. i.e.
- ```
sudo cp my.cnf
my_back.cnf
```

Check to make sure the backup is available

```
botienoh@botienoh: /etc/mysql
botienoh@botienoh:/etc/mysql$ sudo cp my.cnf my_back.cnf
[sudo] password for botienoh:
botienoh@botienoh:/etc/mysql$ ll
total 28
drwxr-xr-x 3 root root 4096 Feb 11 11:15 ./
drwxr-xr-x 110 root root 4096 Feb 2 10:30 ../
drwxr-xr-x 2 root root 4096 Aug 3 2021 conf.d/
-rw----- 1 root root 333 Aug 3 2021 debian.cnf
-rwxr-xr-x 1 root root 1220 Mar 17 2014 debian-start*
-rw-r--r-- 1 root root 839 Feb 11 11:15 my_back.cnf
lrwxrwxrwx 1 root root 24 Aug 3 2021 my.cnf -> /etc/alternatives/my.cnf
-rw-r--r-- 1 root root 839 Aug 3 2016 my.cnf.fallback
botienoh@botienoh:/etc/mysql$
```

- iii. Delete the existing my.cnf file. This will ensure the symbolic link is also dropped.

```
botienoh@botienoh: /etc/mysql
botienoh@botienoh:/etc/mysql$ sudo rm my.cnf
botienoh@botienoh:/etc/mysql$ ll
total 32
drwxr-xr-x 3 root root 4096 Feb 11 11:24 ./
drwxr-xr-x 110 root root 4096 Feb 2 10:30 ../
drwxr-xr-x 2 root root 4096 Aug 3 2021 conf.d/
-rw----- 1 root root 333 Aug 3 2021 debian.cnf
-rwxr-xr-x 1 root root 1220 Mar 17 2014 debian-start*
-rw-r--r-- 1 root root 839 Feb 11 11:15 my_back.cnf
-rw-r--r-- 1 root root 4638 Feb 11 11:22 my.cnf.fallback
botienoh@botienoh:/etc/mysql$
```

- iv. Restore a copy of my.cnf file as follows:  
 sudo cp my\_back.cnf  
 my.cnf

See Index for a sample config variable. Save the settings once done. Check to make sure **my.cnf** file is now available. Note that the symbolic link is not created at this time until MySQL service is restarted.

```
botienoh@botienoh: /etc/mysql
botienoh@botienoh:/etc/mysql$ ll
total 36
drwxr-xr-x 3 root root 4096 Feb 11 11:31 ./
drwxr-xr-x 110 root root 4096 Feb 2 10:30 ../
drwxr-xr-x 2 root root 4096 Aug 3 2021 conf.d/
-rw----- 1 root root 333 Aug 3 2021 debian.cnf
-rwxr-xr-x 1 root root 1220 Mar 17 2014 debian-start*
-rw-r--r-- 1 root root 839 Feb 11 11:15 my_back.cnf
-rw-r--r-- 1 root root 3823 Feb 11 11:31 my.cnf
-rw-r--r-- 1 root root 4638 Feb 11 11:22 my.cnf.fallback
botienoh@botienoh:/etc/mysql$
```

|                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>v. If configs already set, verify, and optimize the following variables based on the available system resources (i.e. Disk space and Physical memory)</p> | <pre>[mysqld] sql_mode="ALLOW_INVALID_DATES,NO_ENGINE_SUBSTITUTION" log_bin_trust_function_creators = 1 innodb_flush_method=O_DIRECT innodb_file_per_table=1 innodb_buffer_pool_size=10G key_buffer_size=32M innodb_log_buffer_size=8M tmp_table_size=256M max_heap_table_size=256M table_definition_cache=2400 table_open_cache=2000 open_files_limit=65535 # adding bind address bind-address = *</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>vi. Key settings to look at under [mysql] section.</p>                                                                                                    | <ul style="list-style-type: none"> <li>- <b>sql_mode</b>: This setting controls the behavior of the database server regarding SQL syntax and data validation. It determines the specific SQL syntax that the server accepts and the data validation rules it enforces.</li> <li>- <b>innodb_buffer_pool_size</b>: This setting allocates system memory as a data cache for your database. If you have large chunks of data, increase this value (can take up-to 75% of RAM). Take note of the RAM required to run other system resources.</li> <li>- <b>log_bin_trust_function_creators</b>: This setting controls whether the server trusts stored function creators to write functions that are safe for binary logging and replication.</li> <li>- <b>bind-address</b>: Refers to the Ip address or name of the host to which the protocol handler is bound. <b>This helps with DWAPI data transmission</b></li> </ul> |

vii. To confirm that the settings have been picked, log into mysql and execute the following queries:

```
show variables like
'innodb_buffer%';
```

**Note:**

The **innodb\_buffer\_pool\_instances** depend on the GB size allocated to **innodb\_buffer\_pool\_size**.  
 For instance, if the **innodb\_pool\_size** is allocated 1GB then the

```
mysql> show variables like 'innodb_buffer%';
+-----+-----+
| Variable_name | Value |
+-----+-----+
innodb_buffer_pool_dump_at_shutdown	OFF
innodb_buffer_pool_dump_now	OFF
innodb_buffer_pool_filename	ib_buffer_pool
innodb_buffer_pool_instances	8
innodb_buffer_pool_load_abort	OFF
innodb_buffer_pool_load_at_startup	OFF
innodb_buffer_pool_load_now	OFF
innodb_buffer_pool_size	4294967296
+-----+-----+
8 rows in set (0.00 sec)
```

*innodb\_buffer\_pool\_size is set to 4GB*

## SECTION 2: JAVA HEAP-SPACE SETTINGS

There are 5 important parameters to be set for Java Heap Space variable as follows:

- Xmx
- Xms
- XX: PermSize
- XX: MaxPermSize
- XX: NewSize

The memory allocation for these parameters depends on the available physical memory. A typical allocation for a 8GB server could be as follows:

Steps: Open terminal (Ctrl+ T)  
 sudo gedit /etc/default/tomcat9

```
The home directory of the Java development kit (JDK). You need at least
JDK version 8. If JAVA_HOME is not set, some common directories for
OpenJDK and the Oracle JDK are tried.
#JAVA_HOME=/usr/lib/jvm/java-8-openjdk
JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64
You may pass JVM startup parameters to Java here. If you run Tomcat with
Java 8 instead of 9 or newer, add "-XX:+UseG1GC" to select a suitable GC.
If unset, the default options will be: -Djava.awt.headless=true

JAVA_OPTS="${JAVA_OPTS} -Xmx2048m -Xms2048m -XX:PermSize=1024m -XX:MaxPermSize=1024m -XX:NewSize=512m"

To enable remote debugging uncomment the following line.
You will then be able to use a Java debugger on port 8000.
#JAVA_OPTS="${JAVA_OPTS} -agentlib:jdwp=transport=dt_socket,address=8000,server=y,suspend=n"

Java compiler to use for translating JavaServer Pages (JSPs). You can use all
compilers that are accepted by Ant's build.compiler property.
#JSP_COMPILER=javac
```

Xmx: 2048m Xms: 1024m -XX: PermSize = 512m -XX: MaxPermSize =512m -XX: NewSize = 512m

### SECTION 3: BACKUP CONFIGURATIONS

#### Background

KenyaEMR database has been configured to self-backup automatically twice a day (11am and 4pm). High backup frequency often creates numerous copies of the database per day that takes up the hard disk space and makes the server performance to degenerate. To correct this anomaly, System Admins need to update the backup frequency to the default twice a day.

The following manual provides a guide on how to correct this. Click [HERE](#) to open

### SECTION 4: STOP ALL UNUSED SCHEDULERS

Schedulers are procedures that are set to execute a particular event at set intervals. System resources are committed to use during scheduler execution and depending on the type of scheduler, this can take up significant amount of resources in your server processing power. To ensure optimal use of server resources, it is recommended that you disable Schedulers that are not in use at your facility. For example, if your site is not using VDOT module, there is no reason to keep it running.

#### Steps:

- On the Developers Panel, click Legacy UI
- On the Admin Panel, click Manage Scheduler
- Under the list of Schedulers, identify and stop schedulers that the facility doesn't need.

#### Observations

[Manage Observations](#)

#### Scheduler

[Manage Scheduler](#)

#### Programs

[Manage Programs](#)

[Manage Triggered State Conversions](#)

**NB: Ensure you also disable them from automatically starting when the system reboots as shown below.**

## Scheduler

[Task Configuration](#)
[Schedule](#)
[Properties](#)

### Schedule

PLEASE NOTE: Changes to the schedule below are NOT passed onto task instances that are already running. After saving your changes, you MUST stop/start the desired task on the Task List page in order to pass these schedule changes onto that task.

Started: true

Start on startup: ☒ *Uncheck this*

Start time pattern: MM/dd/yyyy HH:mm:ss

Start time: 06/10/2021 19:59:59

Repeat interval: 3 minutes

Last Execution Time: 14 February 2022 11:56:59 EAT

## ANNEX: SAMPLE MYSQL CONFIG

```
SAMPLE MYSQL CONFIG FILE
=====
#
The MySQL database server configuration file.
#
You can copy this to one of:
- "/etc/mysql/my.cnf" to set global options,
- "~/.my.cnf" to set user-specific options.
#
One can use all long options that the program supports.
Run program with --help to get a list of available options and with
--print-defaults to see which it would actually understand and use.
#
For explanations see
```

```
http://dev.mysql.com/doc/mysql/en/server-system-variables.html

#
* IMPORTANT: Additional settings that can override those from this file!
The files must end with '.cnf', otherwise they'll be ignored.
#

[mysqld]
sql_mode="ALLOW_INVALID_DATES,NO_ENGINE_SUBSTITUTION"
log_bin_trust_function_creators = 1
innodb_flush_method=O_DIRECT
innodb_file_per_table=1
innodb_buffer_pool_size=10G
key_buffer_size=32M
innodb_log_buffer_size=8M
tmp_table_size=256M
max_heap_table_size=256M
table_definition_cache=2400
table_open_cache=2000
open_files_limit=65535
adding bind address
bind-address = *
!includedir /etc/mysql/conf.d/
!includedir /etc/mysql/mysql.conf.d/
```

\*\*\*\*\*THE END\*\*\*\*\*