Database Configuration Guide

Medtech Evolution

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This documentation contains important information for all Medtech Evolution users and IT Support Personnel. We suggest filing it safely for future reference.
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Chapter 1 - Introduction

This document is intended to explain certain SQL settings that are pre-requisites for the database server configuration for Medtech Evolution.

**Note:** This guide does not cover the Database Configuration settings related to any of the SQL Server High Availability Solutions. (i.e Log Shipping, Database Mirroring etc). For details, please refer to “Evolution_Always-On Implementation and Maintenance Guide.docx”
Chapter 2 – Hardware Specifications

Please refer the Evolution System Requirements document available in below link for the Evolution database hardware specifications:


It is recommended to meet the hardware specifications specified in the above document before proceeding to further installation/configuration.

Also, make sure to maintain the below drive in the server where the SQL Server is installed:

<table>
<thead>
<tr>
<th>Drive</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>OS</td>
</tr>
<tr>
<td>D</td>
<td>SQL &amp; DB</td>
</tr>
<tr>
<td>E</td>
<td>Transaction Logs</td>
</tr>
<tr>
<td>F</td>
<td>Temp DB</td>
</tr>
<tr>
<td>G</td>
<td>Backup</td>
</tr>
</tbody>
</table>

**Tip:** The size allocation for each drive and backup routine should be based on the business requirement. On regular basis, we recommend to move the backup to a different server.

**Note:** It is recommended to point the drive volume from unique hard drive for improved application performance.

SQL Server should have atleast RAID 1 hard drive and for an excellent performance RAID 10 is preferred.

**Storage Type**

Databases read and write performance will vary based on the hard drive where the database is stored:

- If database is stored in SSD/SAN, it will have considerable performance speed.
- It is advisable to store the Transaction log and Temp log files in the SSD drive.
Chapter 3: Operating System Specification/Configuration

Please refer the section “32-Bit/64-Bit Operating System Support” in the “Evolution System Requirements” document available in the below link for the Evolution database server OS specification:


There are certain versions of Microsoft Windows in which Evolution database is not supported which has been highlighted in the document, so please verify the document for the operating system specification.

Windows Firewall Settings

Windows firewall has to be configured with the SQL port without which the SQL server cannot communicate with the TCP/IP connections.

**Note:** If Windows Firewall is turned off in the entire server as per the IT Policies, you can skip these settings.

1. Go to Control Panel→All Control Panel Items→Windows Firewall.
2. Go to Advance Settings option in the Windows Firewall screen.
3. Go to Inbound Rules and check if there are any inbound rules defined with the name SQL or SQL Port, or if there are inbound rules defined with the local port number 1433. If there are no such rules defined, create new rule with the below specifications:
   a. Rule Type – Port
   b. Protocol and Ports
      i. TCP
      ii. Specific local Port: 1433
      iii. Please note that every instance should use a separate port number. The port number is 1433 by default. The next port number could be named 1435 and so on.
   c. Action: Allow the connection
   d. Profile: Tick the checkbox (based on requirement, Domain account is mandatory)
   e. Name: EvolutionSQL
4. Go to Outbound Rules and check if there are any outbound rules defined with the name SQL or SQL Port, or if there are outbound rules defined with the local port number 1433. If there are no such rules defined, create a new rule with the below specifications:
   a. Rule Type – Port
   b. Protocol and Ports
      i. TCP
      ii. Specific local Port: 1433
   c. Action: Allow the connection
   d. Profile: Tick the checkbox (based on requirement, Domain account is mandatory.)
   e. Name: EvolutionSQL

System Settings

1. **Disable Windows Update:**
   Automatic windows update needs to be disabled in the SQL server. The windows update can be done on monthly or bimonthly basis manually in the server if required. Below steps needs to be followed to disable automatic windows update:
   Go to Control Panel→All Control Panel Items→Windows Update→Change Settings. Provide the option ‘Never check for Updates’ in the drop down box.

2. **Regional settings:**
   Refer the SRS document for the system time specification.

3. **Windows Page File Configuration:**
   Refer the below link to change the virtual memory
   **Note:** The Windows Page File settings should be configured in the ratio 1:1.5. i.e., if the RAM is 8 GB, the virtual memory should be set to 12 GB.

4. **Instant File Initialization:**
   Enable this setting by following the below link:
   **Note:** If the Windows Update is through WSUS Server, it is recommended to provide the SQL Server an exemption.
Chapter 4: SQL Database Server Installation

There are certain areas which should be considered during the installation of SQL server. If the SQL server is already installed without considering these areas, the way to change those settings are discussed in Chapter 5.

1. During the SQL server installation, the below features can be left unchecked which won’t be in the Evolution database.
   a. Analysis Service
   b. Reporting Service

2. Select the Mixed Mode authentication in the database engine configuration window.

   **Note:** It is recommended to provide a complex password for SQL Server System Administrator Account.

3. Specify the collation ‘SQL_Latin1_General_CP1_CI_AS’ in the SQL server configuration window as shown below:
Chapter 5: SQL Database Server Configuration

There are some configuration settings that must be verified and set in the SQL server which is explained in this section. Make sure there is no active user in the SQL server while performing the below configuration.

**SQL Server Configuration Manager:**

Below settings in the SQL server configuration manager must be verified:

1. Go to **All Programs** → **Microsoft SQL Server xxxx** → **Configuration Tools** → **SQL Server Configuration Manager**

   ![SQL Server Configuration Manager screenshot]

2. Go to **SQL Server Services**: Enable the below services
   a. SQL Server Agent
   b. SQL Server Browser: Ensure that the SQL Server Browser is running if more than one instance of the server is running.
   c. SQL Server
   d. SQL Server Integration Services xx.x

3. Go to **SQL Server Services**: Disable the below services if Installed and change the start type as ‘Manual’ (if not used by other application)
   a. SQL Server Analysis Services
   b. SQL Server Reporting Services
   c. SQL Full-text Filter Daemon Launcher

4. Expand SQL **Native Client XX.0 Configuration** → **Client Protocols** → **TCP/IP**. Right click **TCP/IP** and enable this option if it is disabled.

   **Note:** Please note that every instance of Inbound/Outbound port requires to be created in the firewall.

5. Go to **SQL Server Services** → Right click each enabled services and go to **Properties** → **Log On** tab. Associate the Active Directory Service account created for SQL server in this tab.
   a. Create and associate Active Directory account for each enabled services.
   b. When the AD account password is changed / expired, it is mandatory to change the service password here as well and restart the SQL services. We recommend having AD account with no password expiry.
SQL Server Management Studio

Below settings in the SQL server configuration manager must be verified and set:

1. Go to All Programs → Microsoft SQL Server xxxx → SQL Server Management Studio and login using the credentials.

2. Right click the Server → Go to Properties → Memory. Provide the Maximum server memory (in MB) based on the below specifications of RAM in the server, so that the remaining memory will be utilized by the operating system:

<table>
<thead>
<tr>
<th>Physical RAM (in GB)</th>
<th>Maximum Server Memory (in MB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>6,400</td>
</tr>
<tr>
<td>12</td>
<td>10,000</td>
</tr>
<tr>
<td>16</td>
<td>13,500</td>
</tr>
<tr>
<td>24</td>
<td>20,500</td>
</tr>
<tr>
<td>32</td>
<td>27,000</td>
</tr>
<tr>
<td>48</td>
<td>42,000</td>
</tr>
<tr>
<td>64</td>
<td>58,000</td>
</tr>
<tr>
<td>72</td>
<td>66,000</td>
</tr>
<tr>
<td>96</td>
<td>90,000</td>
</tr>
<tr>
<td>128</td>
<td>122,000</td>
</tr>
</tbody>
</table>

3. Right click the Server → Go to Properties → Advanced → Parallelism → Max Degree of Parallelism. Set this value based on the system processor core:

<table>
<thead>
<tr>
<th>System Core Processor</th>
<th>Max Degree of Parallelism</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>8</td>
</tr>
</tbody>
</table>
Note: The Microsoft SQL Server max degree of parallelism configuration option controls the number of processors that are used for the execution of a query in a parallel plan. This can be left to default value (0) if you wish not to control the number of processors to be used for execution of a query.

4. Right click the Server → Go to Properties → Security. Select the server authentication as SQL Server and Windows Authentication mode.

5. Right click the Server → Database → Properties → Option.
   a. Set the Evolution DB collation to 'SQL_Latin1_General_CP1_CI_AS'
   b. Set the recovery mode of the Evolution SQL database in the FULL mode.
   c. The values in the Automatic section should be populated according to the below screenshot.

6. Right click the Server → Database Settings → Database default locations. The default Data and Log location can be specified here which will be used during the restoration process.

Evolution Database User

Create a separate SQL login and use that for the Evolution database secured login purpose. Administrator access shouldn’t be provided to the application.

Below steps should be followed for creating a separate user for application (EVOAPPUSR / EVOUSERUSR):
   1. Go to the SQL Server Management Studio → Server → Security → Right click and create new login.
   2. Provide the Login Name and password (complex password is recommended) in the General tab.
3. Check only the Public option in the Server Roles tab.
4. Select the Evolution SQL database in the list of databases.
5. Check the below role membership for the selected database:
   a. db_datareader
   b. db_datawriter
   c. db_executor
6. Grant permission should be provided to connect to database engine, and Enabled option should be selected in the login section in the status tab.

These users only should be used for configuring the Evolution application.

**Note:** For 3rd Parties connecting to Evolution database, separate UserID has to be created with Read only access.

### Temp DB Configuration

Briefcasing will be installed while Evolution software is installed in the machine. Make sure to follow the pre-requisite or configuration settings provided as per the “Evolution Installation Guide”. System requirement should have the minimum of what is provided in the Evolution Installation guide. If the Evolution briefcasing feature is not used by the practice, then kindly ignore this section:

SQL server version and the Evolution build version should be the same in the MAIN database and LAPTOP database. Main evolution database server and laptop should be network with below configuration:

1. Click Start, click All Programs, click Microsoft SQL Server XXX, and then click SQL Server Management Studio.
2. In the Connect to Server dialog box, specify the name of the appropriate SQL Server, and then click Connect.
3. In SQL Server Management Studio, double-click Server Objects, right-click Linked Servers, and then click New Linked Server.
4. In the New Linked Server dialog box, on the General page, in the Linked server text box, enter the full network name ((laptop sql server full name) of the SQL Server you want to link to.
5. Under Server type, click SQL Server.
6. In the left pane of the New Linked Server dialog, under Select a page, choose Security.
7. Choose “Be made using this security context” then enter remote login and password
8. Click OK.
Chapter 6: General Consideration / Recommendations

There are certain considerations for Evolution database based on the SQL version installed and the other features like file stream etc., which are discussed in this section:

**Evolution DB on Express Edition**

Evolution database can be deployed in any SQL environment (Express/Standard/Enterprise). There are certain limitations for the SQL server environment for the Evolution databases on SQL Server Express Edition.

1. SQL Server Express edition will support database up to size of 10 GB (excluding file stream files) and it can use a maximum of 1 GB RAM though the SQL server has more than that.

2. Evolution SQL database should not expand more than 9 GB in the express edition though it supports 10 GB since it might cause issue if the data reaches 10 GB in the middle of a transaction.

3. Below is the recommendation for Evolution Database in SQL Express edition:

<table>
<thead>
<tr>
<th>Evolution Database Size</th>
<th>Yearly Data Growth Acceptable</th>
<th>Can SQL server Express Edition be used?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 5 GB</td>
<td>Up to 512 MB</td>
<td>Yes, Based on yearly data growth</td>
</tr>
<tr>
<td>More than 6 GB</td>
<td>Up to 512 MB</td>
<td>Partially Based on yearly data growth</td>
</tr>
<tr>
<td>More than 5 GB</td>
<td>More than 750MB</td>
<td>No, Recommendation is SQL Server Standard Edition</td>
</tr>
</tbody>
</table>

**Filestream Database Specification**

There are certain settings specific for file stream enabled database. Please verify with Medtech if the database is file stream enabled. If the Evolution database is not filestream enabled, kindly ignore this section:

1. Go to **SQL Server Services → SQL Server (MSSQLSERVER)**. Right click and go to the **FILESTREAM** tab, and enable all the three options in that tab:
2. Right click the Server → Properties → Advanced → Filestream → Filestream Access Level. Set this to Full access enabled if the database is file stream enabled database.

3. SQL Server database backup and restore with file stream will take more time compared to the backup and restore without file stream.

4. File stream database is not supported for database mirroring high availability option.

5. Blob data can be stored in two ways in the database. One as the varbinary data and other as filestream data.
   a. If stored as filestream data, it won’t count in the 10 GB size limitation of the Express edition.
   b. If stored as varbinary, it will be included in the SQL server where the Express edition will support only 10 GB.

   b. Disable last access update on files by following the below steps:
      i. Right-click My Computer → Properties → Advanced system Settings.
      ii. Go to Advanced tab → Environment Variables.
      iii. Under System variables, click New.
      iv. In the Variable name box, type MP_DISABLE_LAST_ACCESS_TIME_UPDATE.
      v. In the Variable value box, type 1, and then click OK.
      vi. Click OK twice to close all the dialog boxes.

7. Ensure the drive where the FileStream is configured is Defragmented for better performance.
General Settings

   
   **Note**: Click the **Other Versions** menu under the heading in the above link to check the features supported for other version of SQL server.

2. Make sure to exclude anti-virus checking for the all data/log/backup files, SQL port and the SQL server related exe applications.

3. Make sure MS Distributed Transaction Coordinator setting is enabled as specified in Evolution Software Requirement Specification (SRS) document.

4. There shouldn’t be any 3rd party application installed in the server.

5. Server shouldn’t have any other browser other than Internet Explorer.

6. Refer “Evolution Database Maintenance Guide” for the steps related to below tasks:
   a. Back-up and restore
   b. Maintenance plan
   c. Attach/Detach

7. Restart the machine/server once all the configuration settings are changed, without which the settings won’t be applied to the SQL server completely.
For further information, or any other queries regarding the changes in this release, please contact Medtech Support as follows:

- Via the Evolution application [Help ► Contact Support]
- By email to support@medtechglobal.com
- By fax to 0800 MEDTECH (633 832)
- By phone on 0800 2 MEDTECH (633 832)