

[Tech Note 921](#)

Optimizing SQL Server for Large Galaxy Migration

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Introduction

This *Tech Note* provides tips and configuration recommendations to migrate a large Galaxy in the context of Arcestra System Platform 2012 (ASP 2012). The information is intended to mitigate potential problems, such as using the default SQL Server settings for the migration.

For example, you might see the following logger errors when migrating a large Galaxy:

- **WWCdi Error 80040E14: Description 'Warning: The join order has been enforced because a local join hint is used'**
- **Error 80040E2F: Description 'Violation of PRIMARY KEY constraint. Cannot insert duplicate key in object'**

Application Versions

- Arcestra System Platform 2012 and later (Application Server version 3.5 and later)

Important! Before making any configuration changes, be sure you have backed up your Galaxy, Log (SMC Log) and Registry files.

Optimization Tasks

The following tasks are recommended to ensure your migration is successful:

- [Change Transaction Log Restrictions](#)
- [Configure Anti-Virus Exclusions](#)
- [Optimize SQL Server General Settings](#)
- [Optimize SQL Server for Galaxy Databases](#)
- [Monitor and Re-adjust the DB Size](#)

Note: The content in this *Tech Note* was included as general guidelines in the Application Server Readme.html as a workaround procedure for handling unexpected and misleading errors that appear in the logger while migrating large Galaxies. In that scenario, the transaction log for the Galaxy database reached its maximum allocated size.

Change Transaction Log Restrictions

The following steps show how to remove restrictions on the size of the galaxy database transaction log:

- Scan windows events (in the Event Viewer) for evidence that the transaction log is in fact full.

If you confirm that the transaction log has exceeded the size restrictions, do the following to remove the restriction:

1. In the SQL Server Management Studio, right click the Galaxy database, then click **Properties**.
2. In the **Database Properties** dialog box, locate Log ... in the **File Type** column, then click the Ellipsis (...) button in the **Autogrowth** column.
3. In the **Change Autogrowth for Base_Application_Server_log** dialog box, click the **Unrestricted File Growth** option under the **Maximum File Size** parameter.
4. Click **OK**.
5. Complete the Galaxy migration, then repeat these steps to reinstate a file size ceiling on the transaction log.

Configure Anti-Virus Exclusions

If possible, uninstall the Anti-virus software from the Galaxy nodes.

If this is not possible, ensure the Anti-virus software is enabled as described in the ASP2012 Readme file.

• Ensure the Exclusion list includes the Windows Temp files. The following instructions show how to configure the exclusions in McAfee VirusScan:

1. Using McAfee, open the VirusScan Console and click **Task/On-Access Scanner Properties/All Processes**.
2. Click the **Exclusions** tab, then the **Exclusions** button.
3. Click **Add**.
4. Add the **C:\Windows\Temp** directory (Figure 1 below).

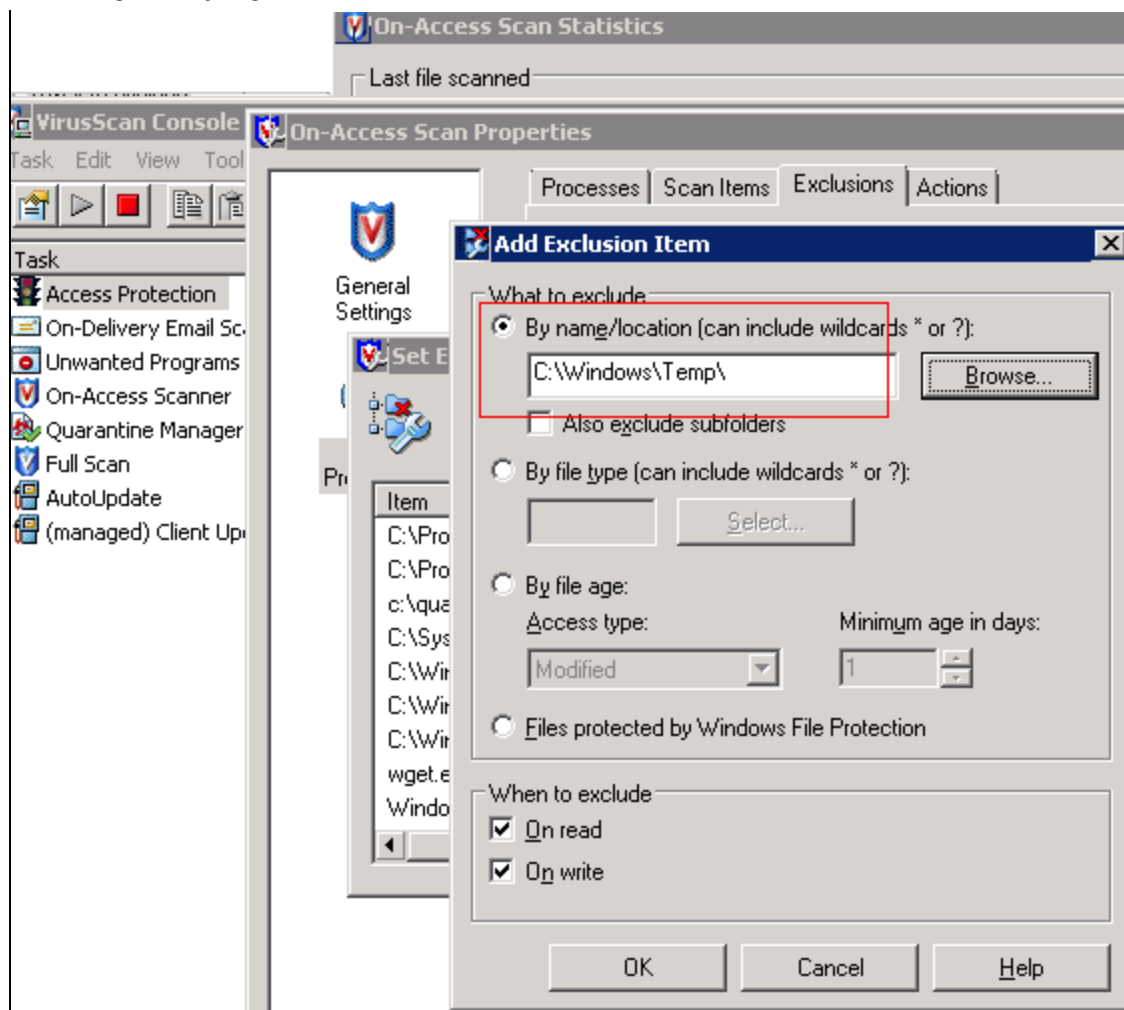


FIGURE 1: ADD WINDOWS TEMP DIRECTORY

Optimize SQL Server General Settings

SQL Server Memory Setting

The SQL Server installation sets the RAM utilization to a very large number (2 Terabytes) by default. When this is the case, SQL Server might give memory back to a process if requested, but may just as easily consume the memory without releasing it.

- Wonderware Technical Support recommends setting a **smaller** maximum memory value for SQL Server. Application Server should have a configured SQL Server memory setting of approximately **65%** of the current physical RAM.

For example, if the current hardware configuration is a 16-core machine with 48 GB RAM, the SQL Server maximum memory would be **32768** MB (65% of the 48 GB).

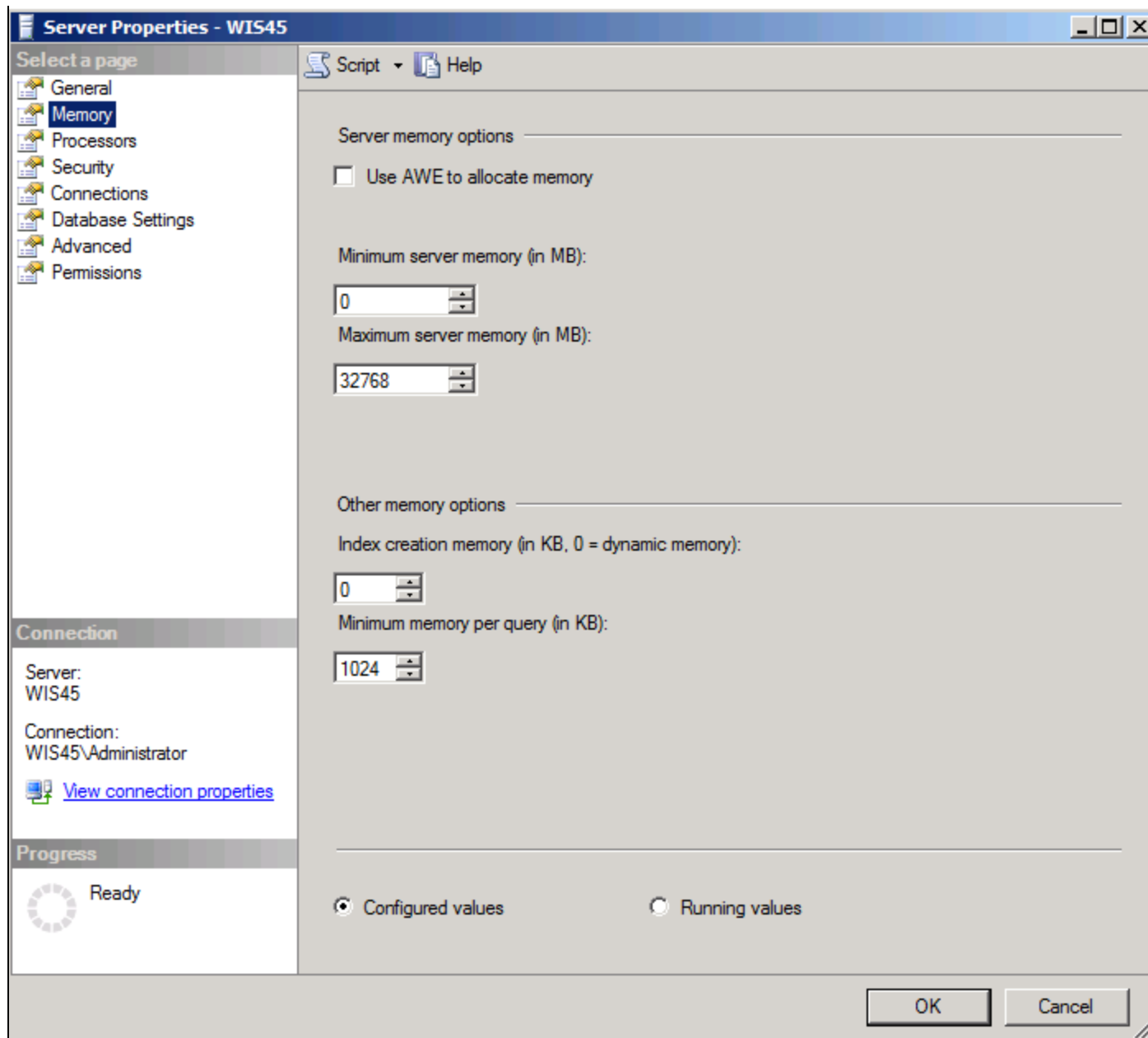


FIGURE 2: MAXIMUM MEMORY SETTING FOR SQL SERVER

General SQL Server Database Settings

- Change the Default index fill factor from **0** to **90**.

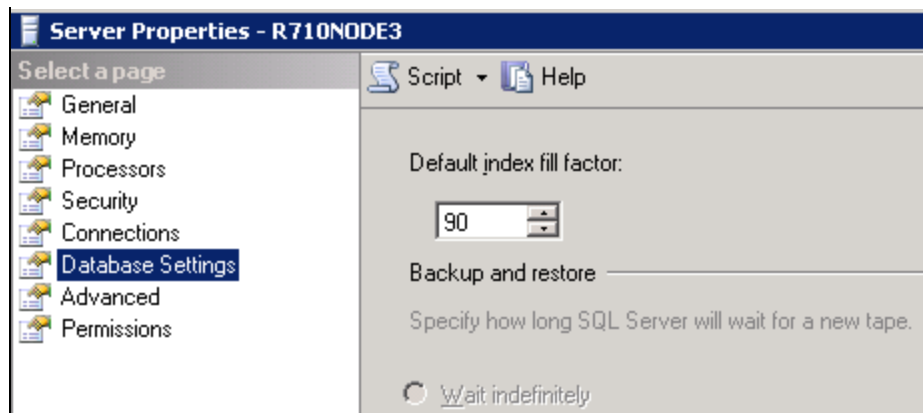


FIGURE 3: DEFAULT INDEX FILL FACTOR

SQL Server Optimizations for System Databases

For the Master DB

- Verify the configuration of the database files by clicking the Master DB and clicking **Properties**, then **Files**.

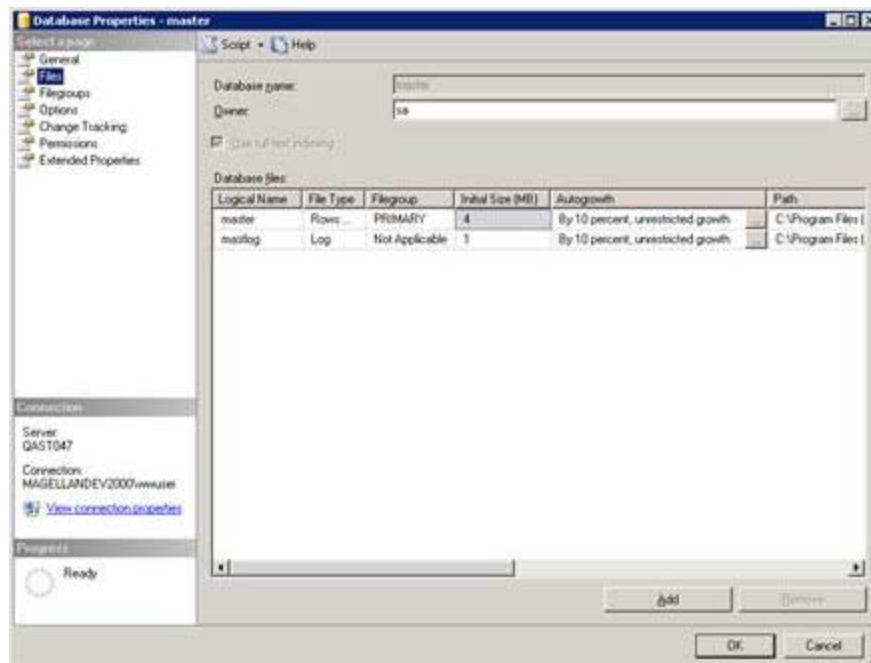


FIGURE 4: MASTER AND LOG FILE DB SETTINGS

Modify the database files to minimize fragmentation by doing the following:

- Change the initial file size to **100 MB** for both the database and the transaction logs.

- Set the Autogrowth parameters to a percentage value.
- Increase the file growth to a fixed size such as 200MB.

For example if you have a database that is 50MB original size, enabling the file growth by 10% grows the database file by increments of **5MB** each time. At 400MB, you then have the database file **partitioned** many times. When you enable the database growth by *size*, your database file is partitioned only 4 times.

For the tempdb

Do the following for the tempdb:

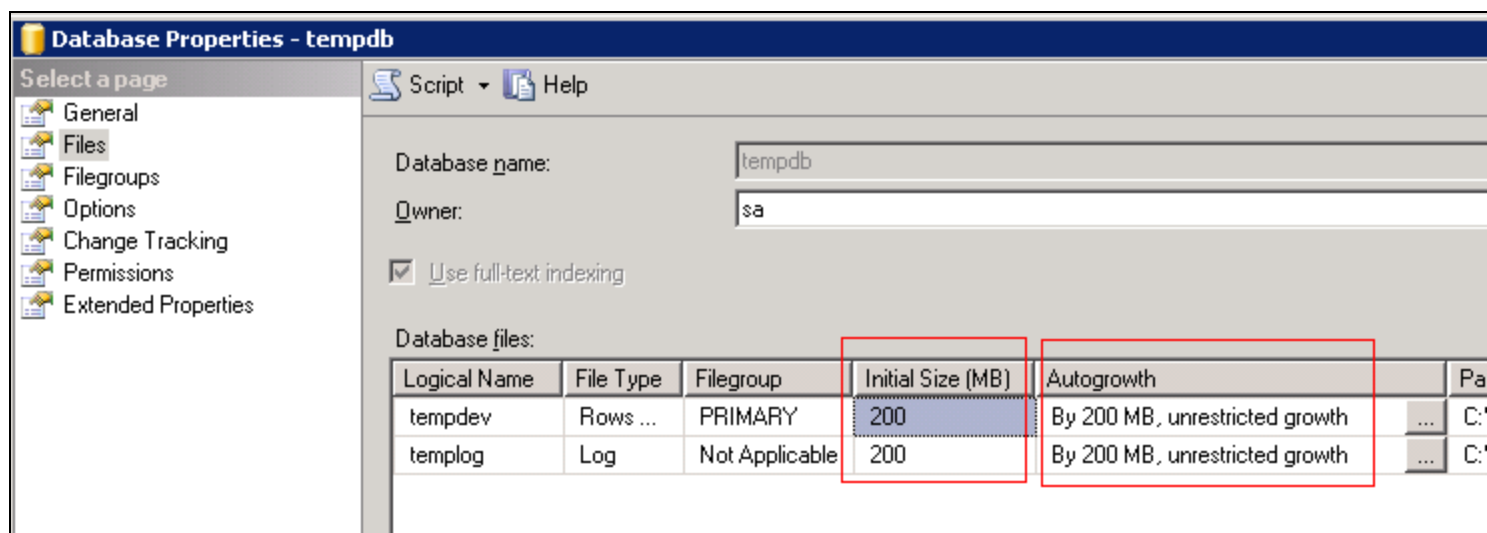


FIGURE 5: TEMPDB FILE SIZE AND AUTOGROWTH SETTINGS

- Set the recovery mode to **Simple**.
- (Optional) move the tempDB path to a different physical hard disk.

```
USE MASTER
GO
ALTER DATABASE TEMPDB
MODIFY FILE (NAME = tempdev, FILENAME = 'D:TempDBtempdb.mdf')
GO
ALTER DATABASE tempdb
MODIFY FILE (NAME = templog, FILENAME = 'D:TempDBtemplog.ldf')
GO
```

Configure the settings for your Galaxy database (for example: CCP1DCS)

- Configure the initial size to **500MB** for both MDF and LDF.
- (Optionally) Configure the growth to **500MB** for both MDF and LDF. This helps reduce fragmentation.
- Ensure the recovery mode is set to Simple.
- Stop and restart SQL Server.

Adjust the Proxy Polling Rate

The following setting determines how often to refresh the IDE Galaxy Tree.

We do not recommend changing this value unless a big operation is going to occur, such as importing thousands of objects or migrating your Galaxy. Reset the rate to the original value when those operations are finished. This ensures the correct States will be displayed in the Galaxy Tree View when you perform future operations.

- Change the ProxyPollingRate in the registry to 10 seconds:

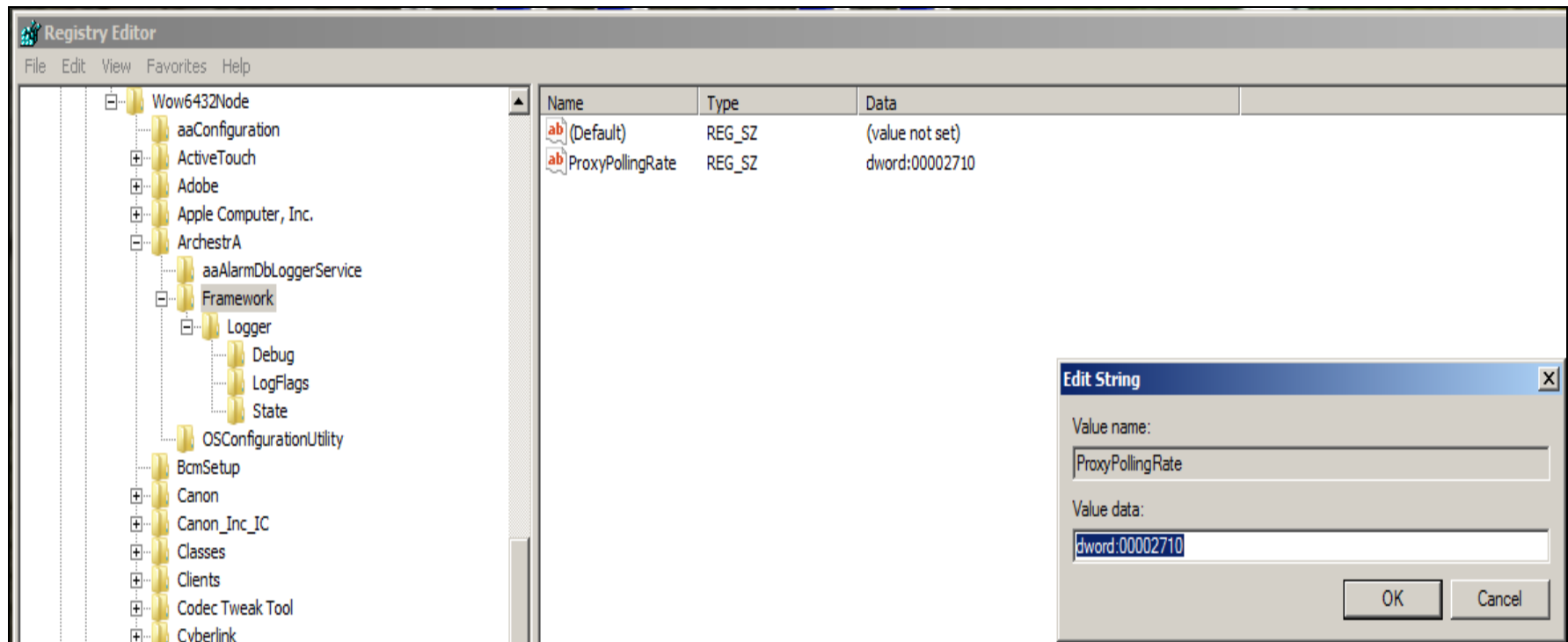


FIGURE 6: SET PROXY POLLING RATE TO 10 SECONDS

Windows Registry Editor Version 5.00

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\ArchestrA\Framework]
```

```
"ProxyPollingRate"=dword:00002710 (10000)
```

- Reset it to the default value:

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\ArchestrA\Framework]
```

```
"ProxyPollingRate"=dword:000001f4 (500)
```

Change Restrictions on the Transaction Log Size

If you have confirmed that the transaction log has exceeded the size restrictions, do the following to remove the restriction:

1. From SQL Server Management Studio, right-click your Galaxy DB and click **Properties**.
2. Click **Files**, then click on the **Log** database file to change the restrictions.

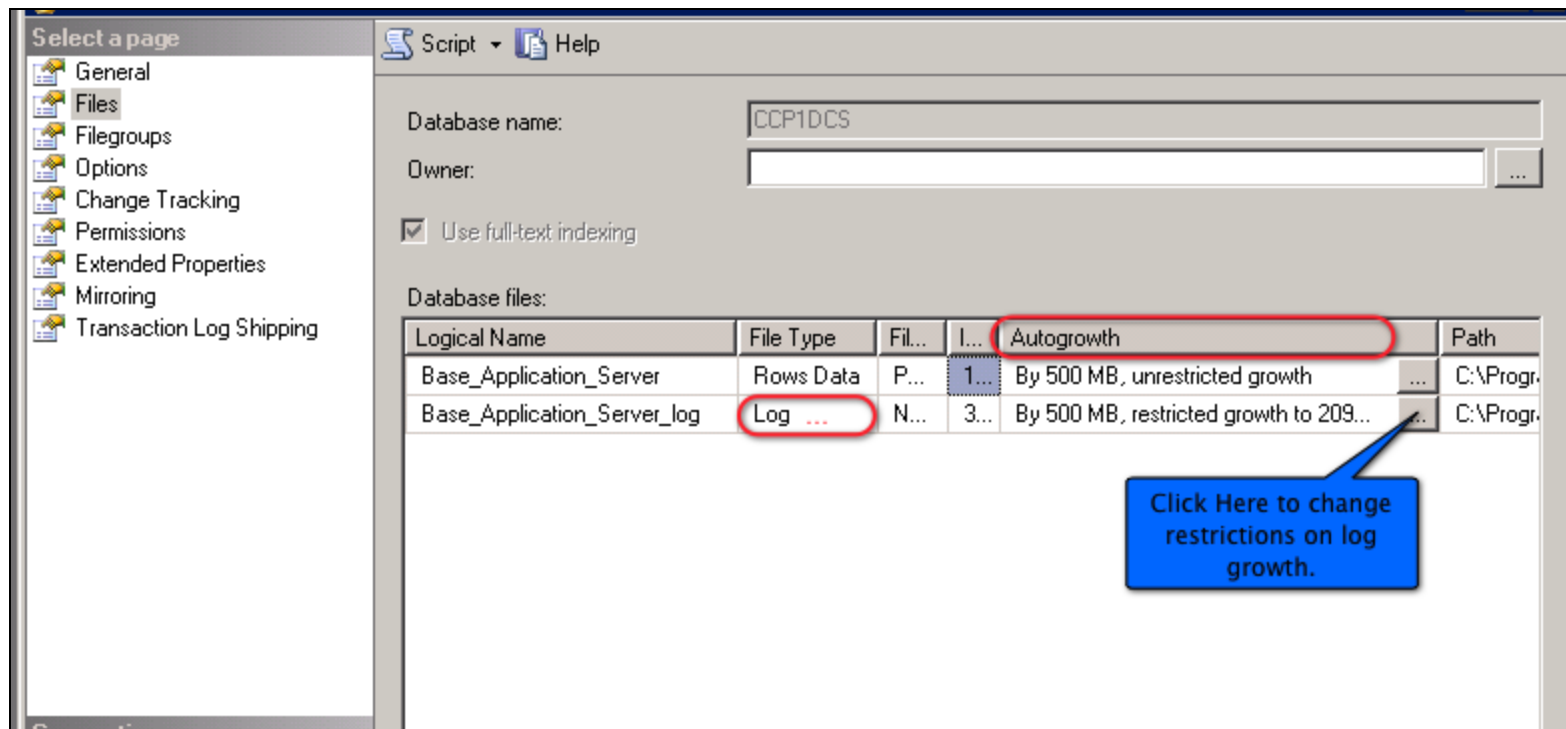


FIGURE 7: CHANGE RESTRICTED FILE GROWTH SETTING

3. Select **unrestricted file growth**.

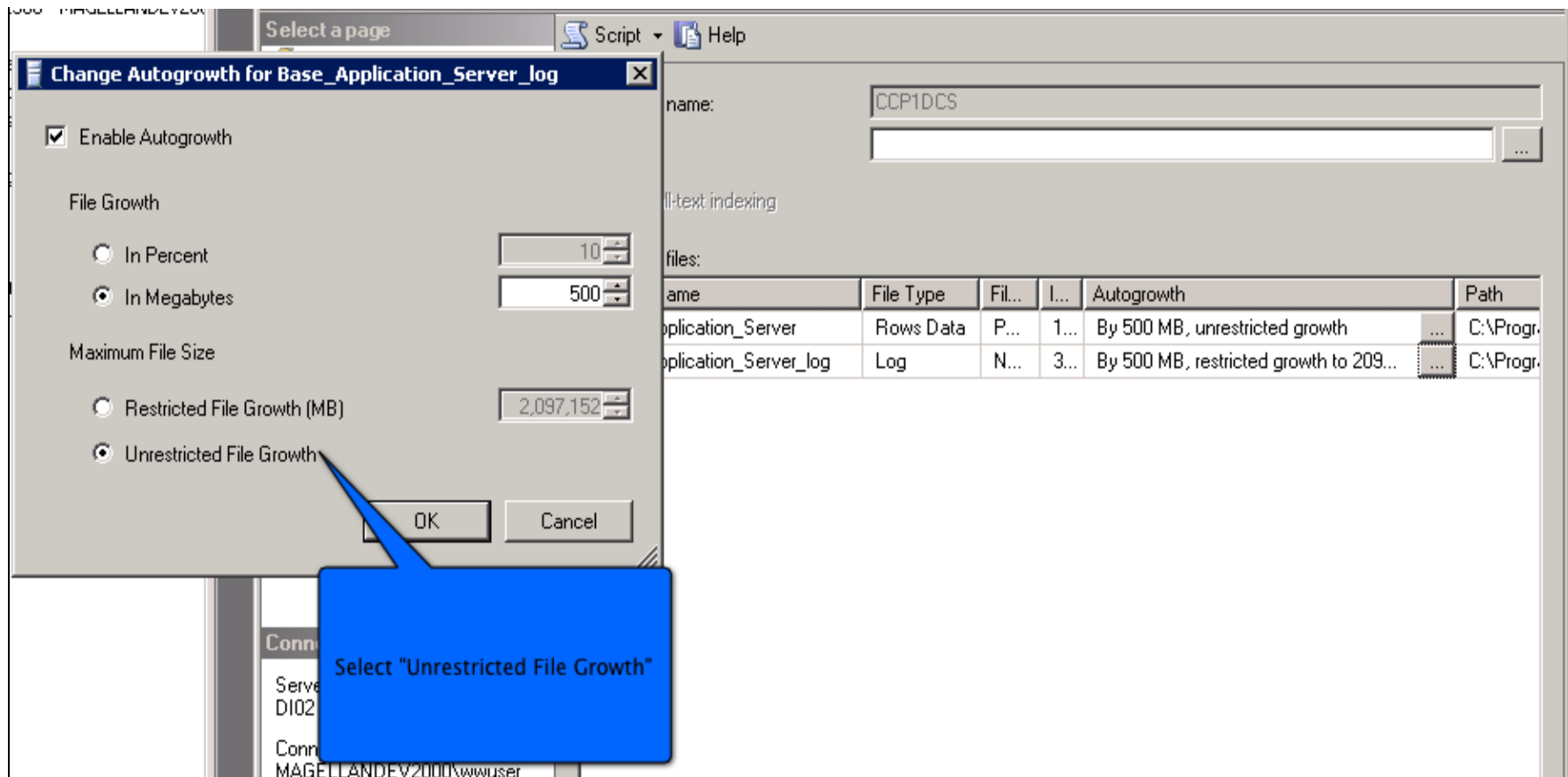


FIGURE 8: UNRESTRICTED FILE GROWTH

Monitor and Re-adjust the DB Size

You need to monitor database and transaction log over time and adjust again.

To Monitor your DB Size

- Use Perfmon Alerts to monitor the database size and the Transaction log. If either reaches a certain threshold, you can send an "alert" email.

To Re-adjust your DB

You can choose to just shrink the transaction log file individually by right-clicking the Galaxy DB, and clicking **Tasks/Shrink/Files**.

- You can also re-adjust the growth parameters.

References

Monitoring Log File Growth using PerfMon

- <http://sqlserverpedia.com/blog/sql-server-bloggers/monitoring-log-file-growth-using-perfmon/>
- <http://bradcorbin.net/2009/09/monitoring-log-file-growth-using-perfmon/>

Integrating Profiler and PerfMon Log Files

- <http://www.sqlteam.com/article/integrating-profiler-and-perfmon-log-files>

Note: After the Galaxy migration is finished, follow the same procedure to reestablish a ceiling on the transaction log. In other words, reset it to what it was before the migration was initiated.

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