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# Optimizing Microsoft SQL Server on the Galaxy Repository Node

## LEGACY TECH NOTE #

826

## SUMMARY

This *Tech Note* describes configuration points for optimizing Microsoft SQL Server performance and management when it is installed on the Galaxy Repository (GR) Node.

## SITUATION

### Application Versions

- Wonderware Application Server 3.1 SP3 P1 and later
- Microsoft SQL Server 2005 and later

## Configuration List

- [Anti-Virus Exclusions](#)
- [General Settings](#)
- [System Database Settings](#)
- [Galaxy Database Settings](#)
- [Proxy Polling Settings](#)
- [Maintenance Plan](#)

## Anti-Virus Exclusions

Ensure the Exclusions list includes **Windows Temp** files.

For example, you want to set up the following (this example uses McAfee):

- In the VirusScan Console, click **Task**, then **On-Access Scanner Properties**
- Click **All Processes** and click the **Exclusion** tab.
- Click the **Exclusions** button, then click **Add**.
- Add the **C:\windows\temp\** directory (Figure 1 below)

### Other Recommended Exclusions:

- Program Files\ArchestrA\Framework\Bin\CheckPointer
- Program Files\ArchestrA\Framework\Bin\GalaxyData
- Program Files\ArchestrA\Framework\Bin\GlobalDataCache
- Program Files\ArchestrA\Framework\Bin\Cache
- Documents and Settings\All Users\ApplicationData\ArchestrA (default setting, specified on WinPlatform editor's General page, History Store Forward Directory option)

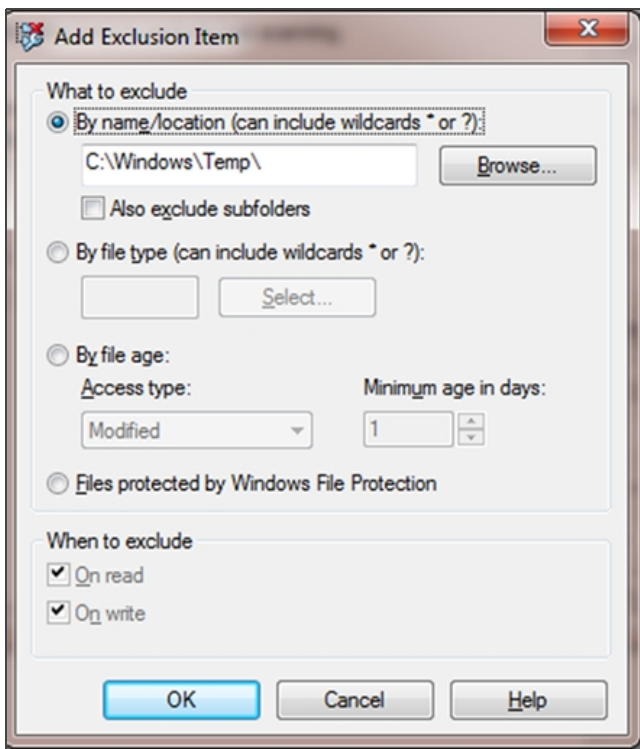


Figure 1: Windows\Temp\ Location in the Exclusion Item List

## General Settings

### SQL Server Processors

- Uncheck Processor 0 – The IDE/aaGR will run best when SQL Server is not using this Processor.

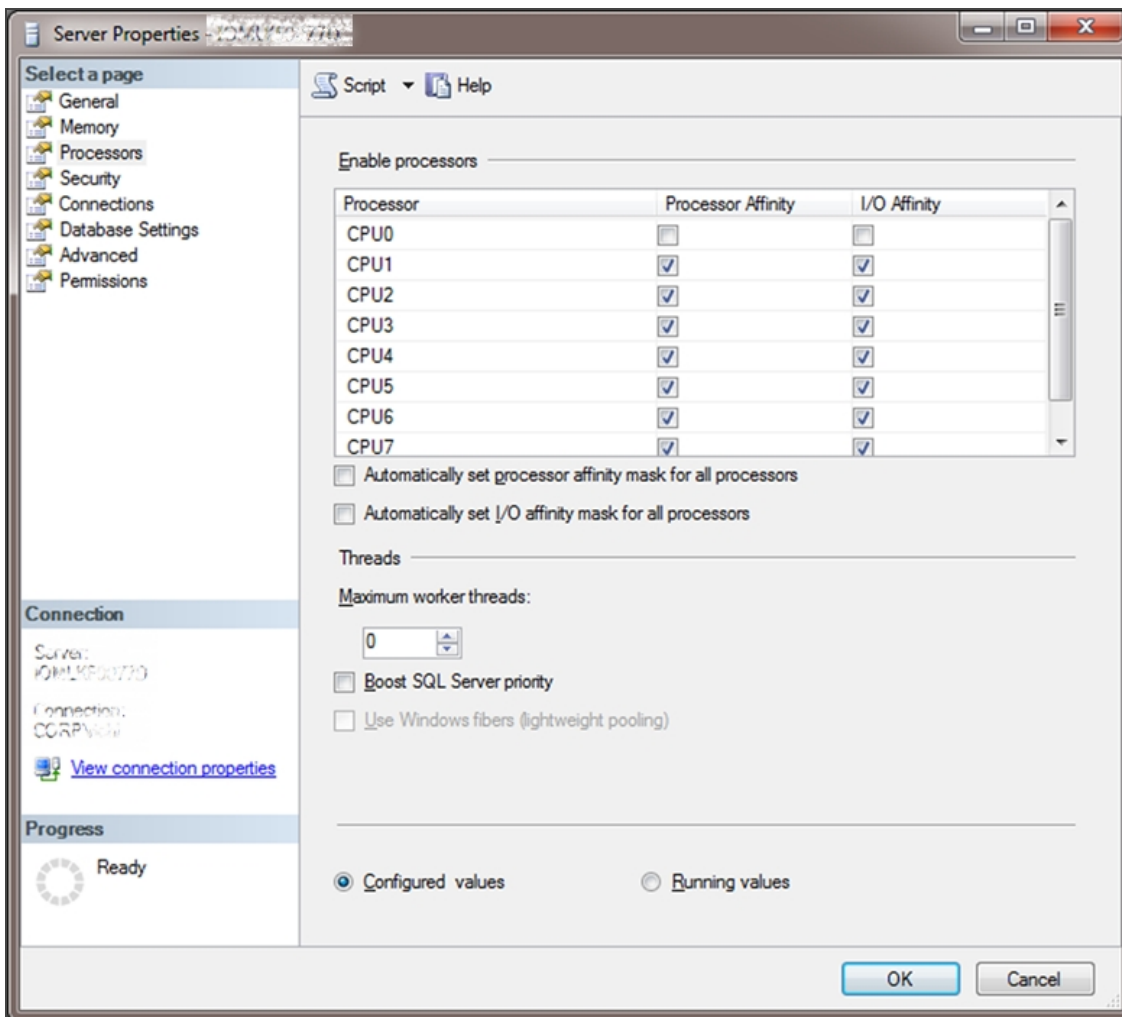


Figure 2: Uncheck CPU "0"

## SQL Server Memory Settings

- By default, the SQL Server installation will set the RAM utilization to a very large number (2 Terabytes).
- SQL may give memory back to a process if requested.
- It is highly recommended to clamp the SQL Server maximum memory to at least 70% of the maximum available RAM (Figure 3 below).

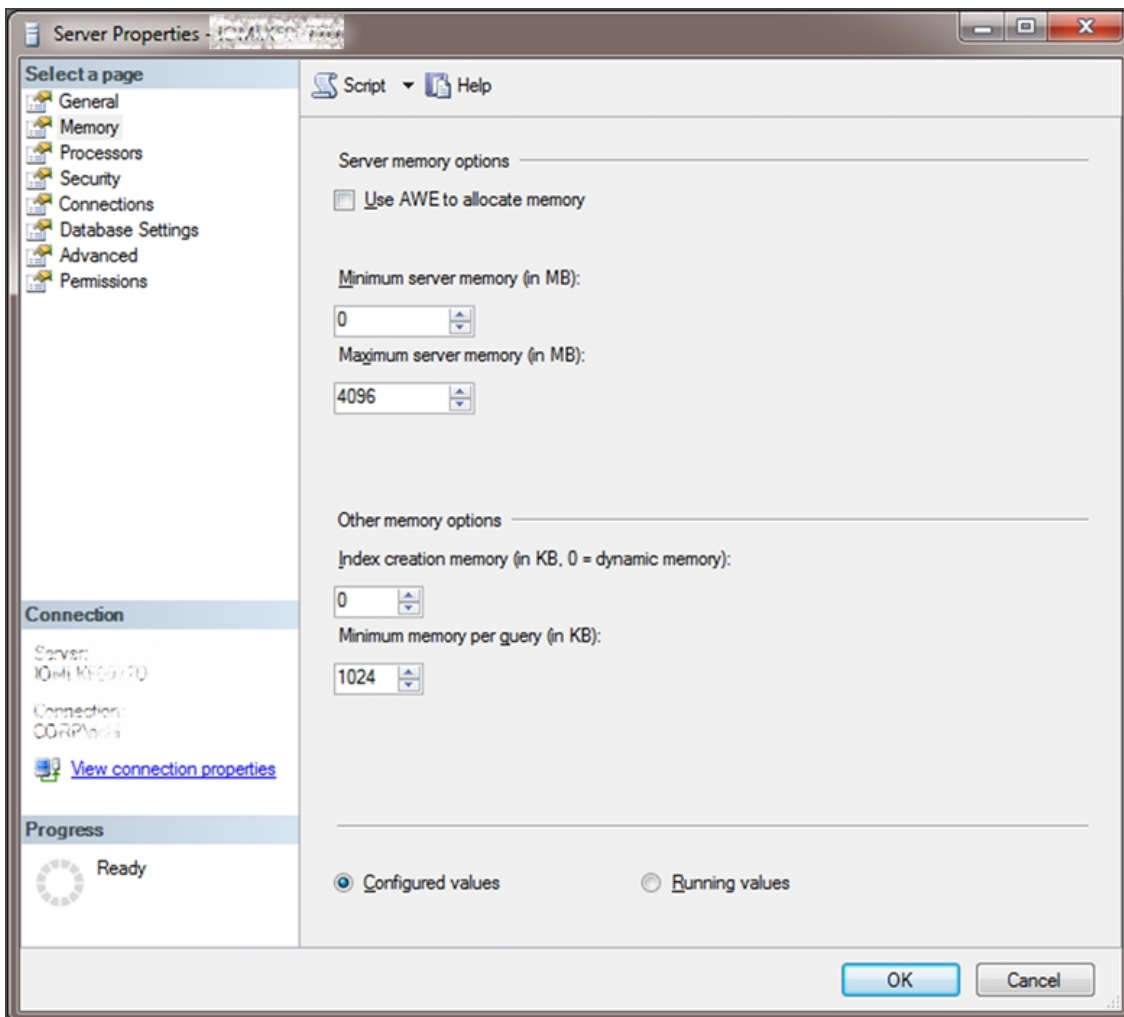


Figure 3: Set Maximum Memory Usage

## General SQL Server Database Settings

- Change the Default index fill factor from 0 to 80.

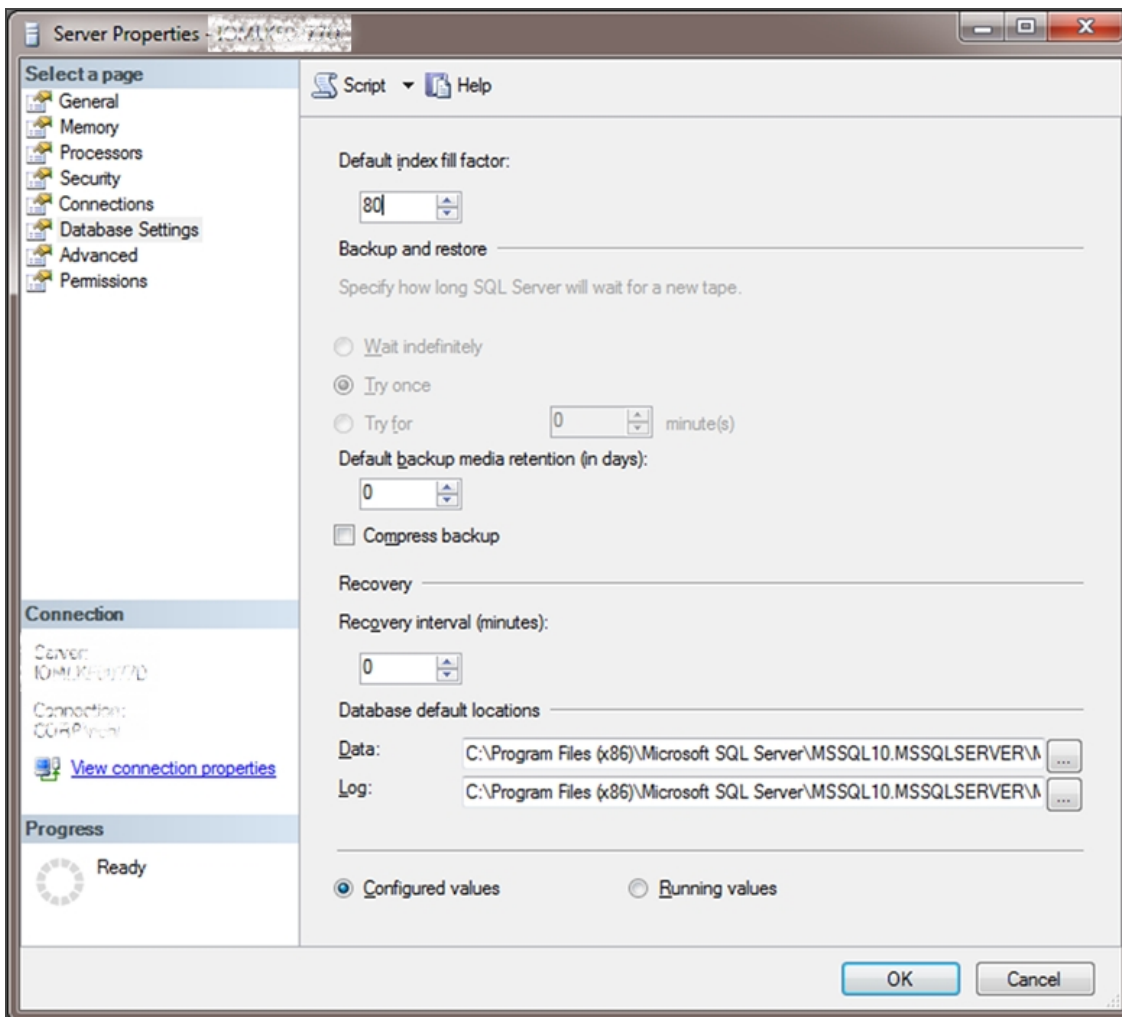


Figure 4: Database Settings -> Default Index Fill Factor

## System Database Settings

### Master Database Settings

- Verify the configuration of the database files.

Database name: master

Owner: sa

☒ Use full-text indexing

Database files:

Logical Name	File Type	Filegroup	Initial Size (MB)	Autogrowth
master	Rows ...	PRIMARY	100	By 200 MB, unrestricted growth
mastlog	Log	Not Applicable	100	By 200 MB, unrestricted growth

Figure 5: Master and MastLog DB File Configuration Settings

- Modify the database files to minimize fragmentation.
- Change the initial file size to **100MB** for both database and transaction log
- Increase the file growth to a fixed size such as **200MB** (Figure 6 below):

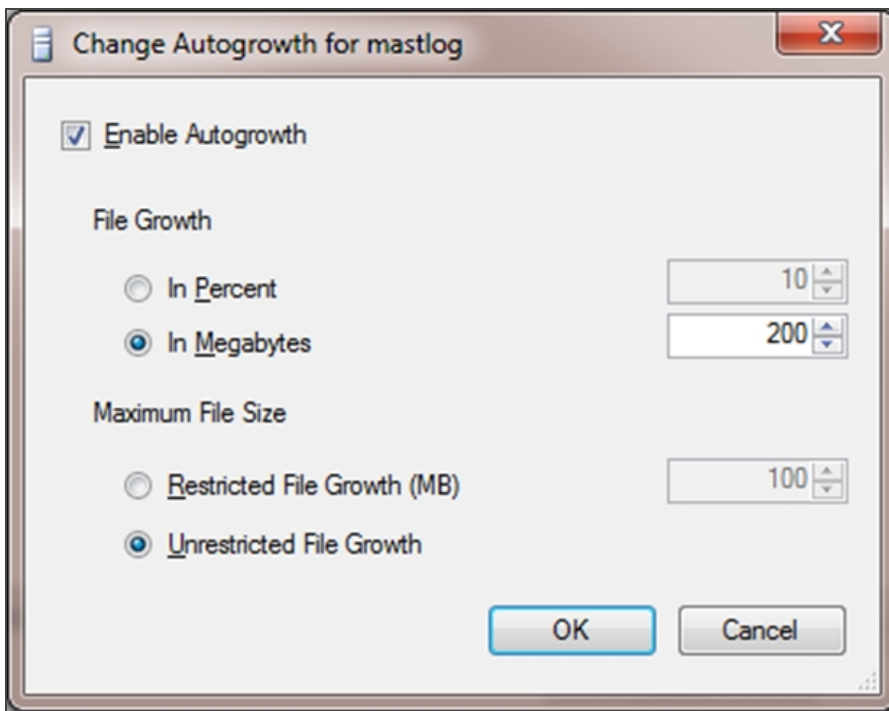


Figure 6: Autogrowth Configuration

For example:

- If you have a database that is 50 MB in original size, enabling file growth by 10% will grow the database file increments of 5MB each time.  
If your resulting database is 400MB, you then have the database file partitioned many times.
- If instead you enable the database growth by size, you will have a resulting database file that is partitioned only 4 times in this case.

## TempDB

- Configure the same settings for the **tempdb** (IMPORTANT).

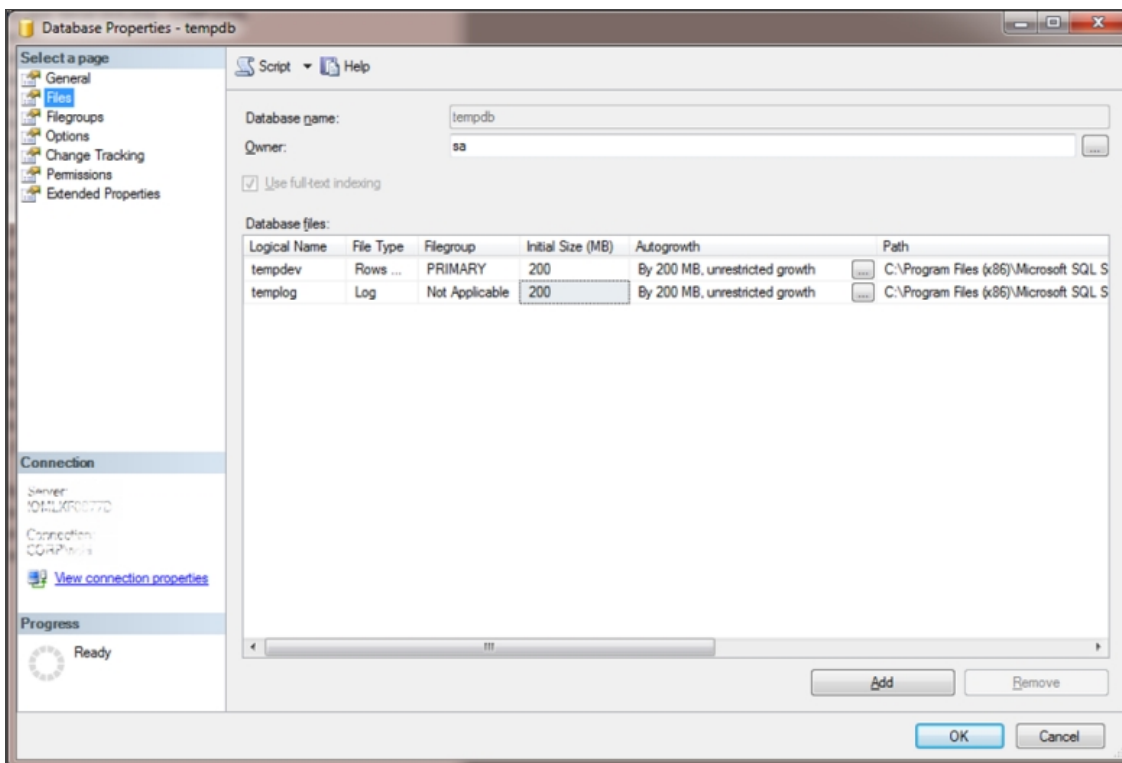


Figure 7: Tempdb Settings

- Ensure the Recovery mode is set 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
```

## Galaxy Database Settings

For your database (Galaxy database, example: PT\_Master):

- Configure the initial size to **500MB** for both MDF and LDF.
- Configure the autogrowth to **500MB** for both MDF and LDF. This helps reduce fragmentation.

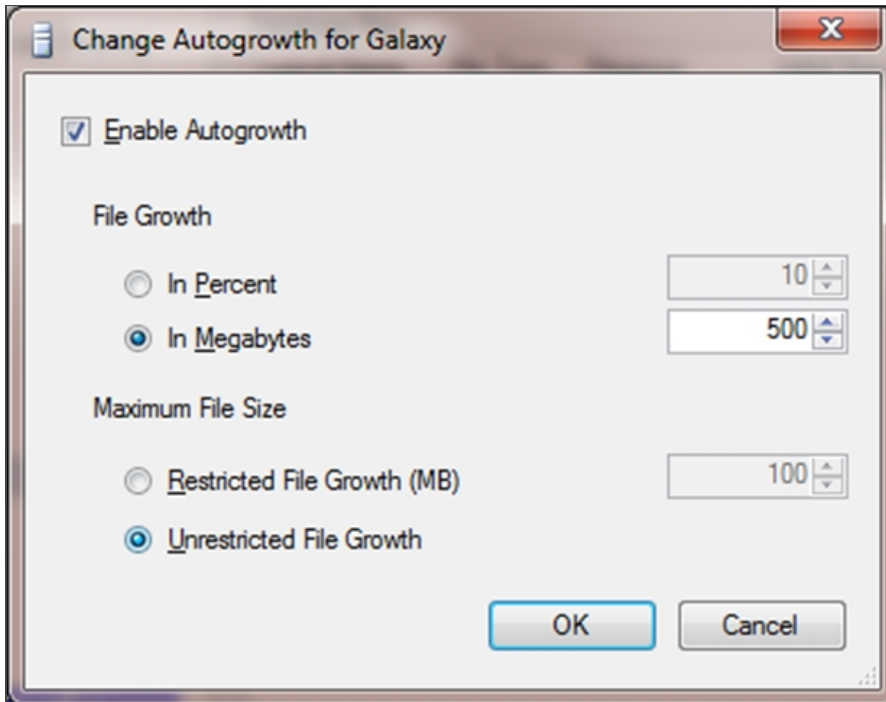


Figure 8: Autogrowth Setting for Galaxy DB

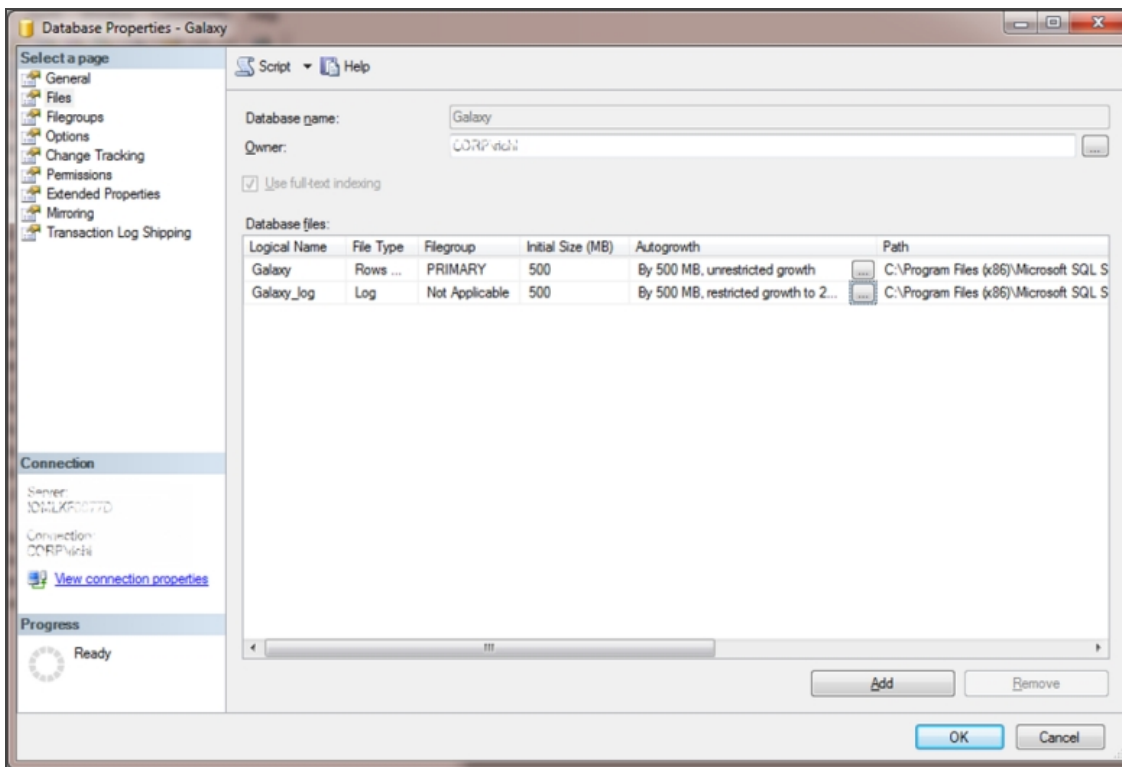


Figure 9: Galaxy Database and Galaxy\_log DB

- Ensure recovery mode is set to **Simple** and stop/restart SQLServer.

## Proxy Polling Settings

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

We do not recommend changing unless a big operation is going to occur like importing thousands of objects or migrating. The setting should be reset when finished, otherwise when you perform operations the tree will not display the correct state, such as **Checked in**.

- Change the setting in the registry (as follows), to 10 seconds

Windows Registry Editor Version 5.00

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Archestra\Framework]
"ProxyPollingRate"=dword:00002710 (10000)
```

- Set it to normal:

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Archestra\Framework]
"ProxyPollingRate"=dword:000001f4 (500)
```

## Maintenance Plan

Create a Maintenance Plan in the Object explorer under Management. Run this task weekly to keep the database running smoothly.

The following graphics show recommended settings for the SQL Server Maintenance Plan.



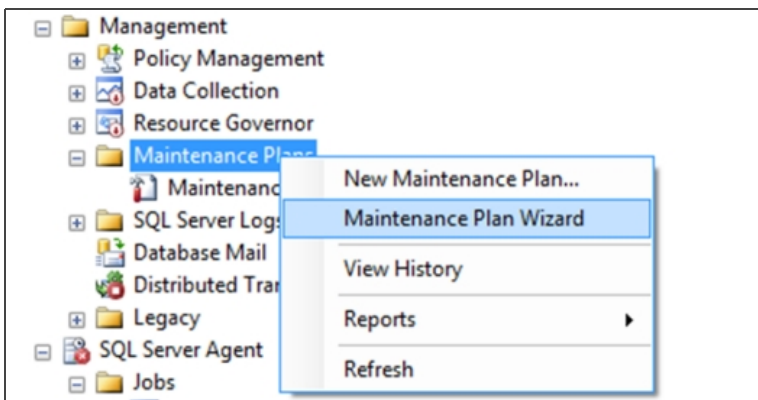


Figure 10: Create Maintenance Plan

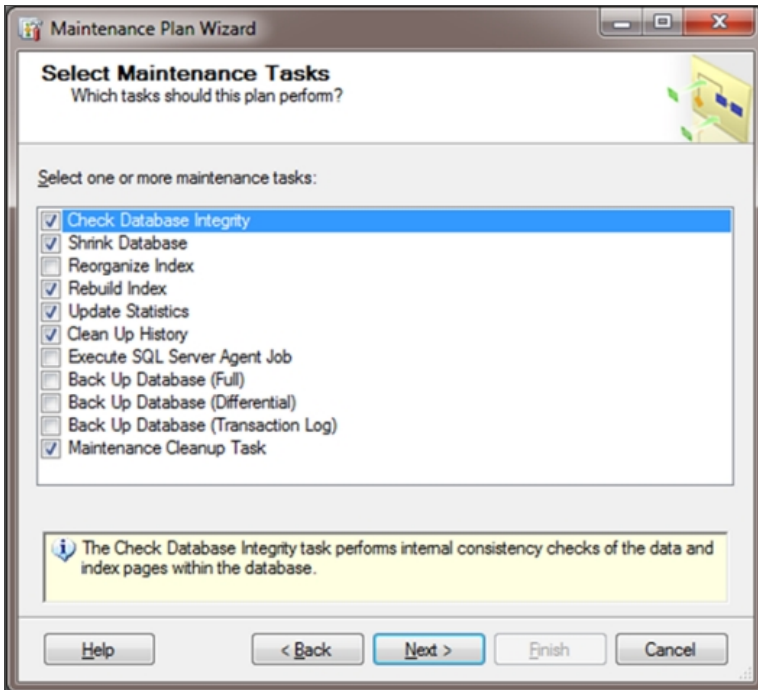


Figure 11: Maintenance Plan Wizard: Select Tasks

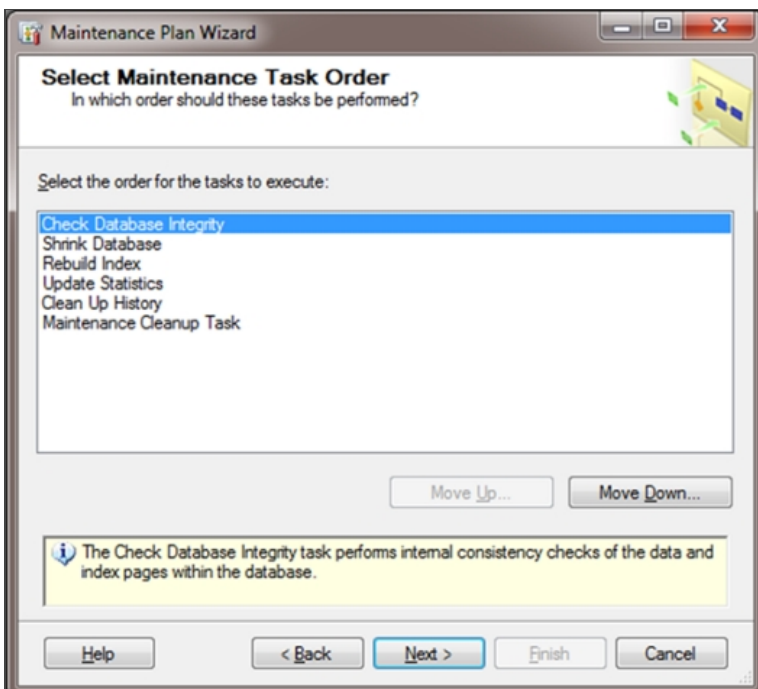


Figure 12: Maintenance Task Order

The screenshot shows the 'Define Database Check Integrity Task' step of the Maintenance Plan Wizard. The title bar reads 'Maintenance Plan Wizard'. The main heading is 'Define Database Check Integrity Task' with the subtitle 'Configure the maintenance task.' Below this, there is a 'Databases:' label followed by a dropdown menu currently set to 'Specific databases'. A checkbox labeled 'Include indexes' is checked. At the bottom, there is a 'Schedule:' section with a text box containing 'Not scheduled (On Demand)' and a 'Change...' button. The bottom of the window features a row of buttons: 'Help', '< Back', 'Next >', 'Finish >>', and 'Cancel'.

Figure 13: Select DB for Maintenance

The screenshot shows the 'Define Shrink Database Task' step of the Maintenance Plan Wizard. The title bar reads 'Maintenance Plan Wizard'. The main heading is 'Define Shrink Database Task' with the subtitle 'Configure the maintenance task.' Below this, there is a 'Databases:' label followed by a dropdown menu currently set to 'Specific databases'. There are two input fields: 'Shrink database when it grows beyond:' with a value of '500' and 'MB', and 'Amount of free space to remain after shrink:' with a value of '20' and '%'. Below these are two radio buttons: 'Retain freed space in database files' (unselected) and 'Return freed space to operating system' (selected). At the bottom, there is a 'Schedule:' section with a text box containing 'Not scheduled (On Demand)' and a 'Change...' button. The bottom of the window features a row of buttons: 'Help', '< Back', 'Next >', 'Finish >>', and 'Cancel'.

Figure 14: Configure Shrink Tasks

**Maintenance Plan Wizard**

**Define Rebuild Index Task**  
Configure the maintenance task.

Databases: Specific databases

Object: Tables and views

Selection:

Free space options

☒ Reorganize pages with the default amount of free space

☐ Change free space per page percentage to:  %

Advanced options

☐ Sort results in tempdb

☐ Keep index online while reindexing

Schedule:  
Not scheduled (On Demand) Change...

Help < Back Next > Finish >> Cancel

Figure 15: Configure Rebuild Index Task

**Maintenance Plan Wizard**

**Define Update Statistics Task**  
Configure the maintenance task.

Databases: Specific databases

Object: Tables and views

Selection:

Update:

☒ All existing statistics

☐ Column statistics only

☐ Index statistics only

Scan type:

☒ Full scan

☐ Sample by 50

Schedule:  
Not scheduled (On Demand) Change...

Help < Back Next > Finish >> Cancel

Figure 16: Define Update Statistics Tasks

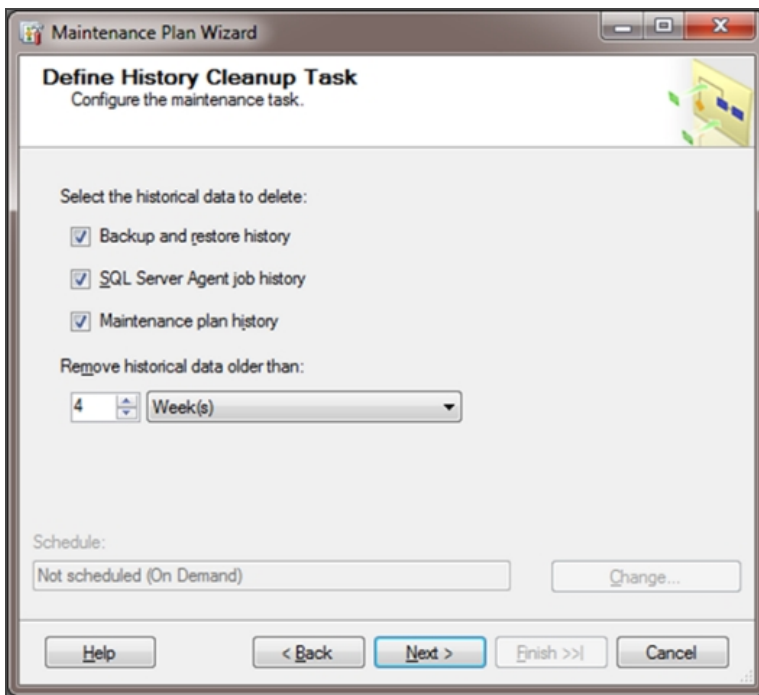


Figure 17: Define History Cleanup Task

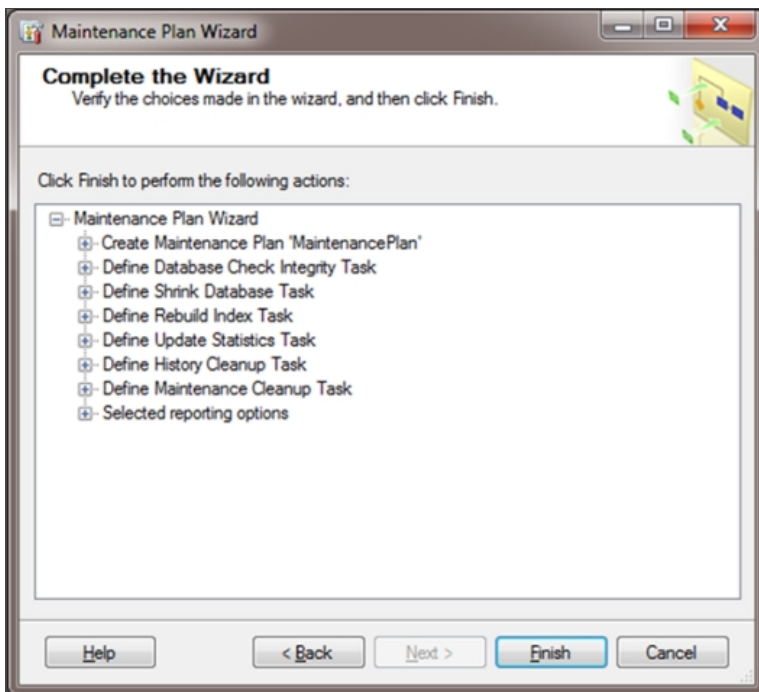


Figure 18: Complete Task Definition

When you complete the Task Definition, the Maintenance Plan appears in the **Jobs** folder of the SQL Server Agent (Figure 19 below).

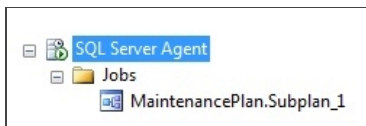


Figure 19: SQL Server Agent Job

1. Right-click the Maintenance Plan and click **Properties**, then **Schedules/New**.

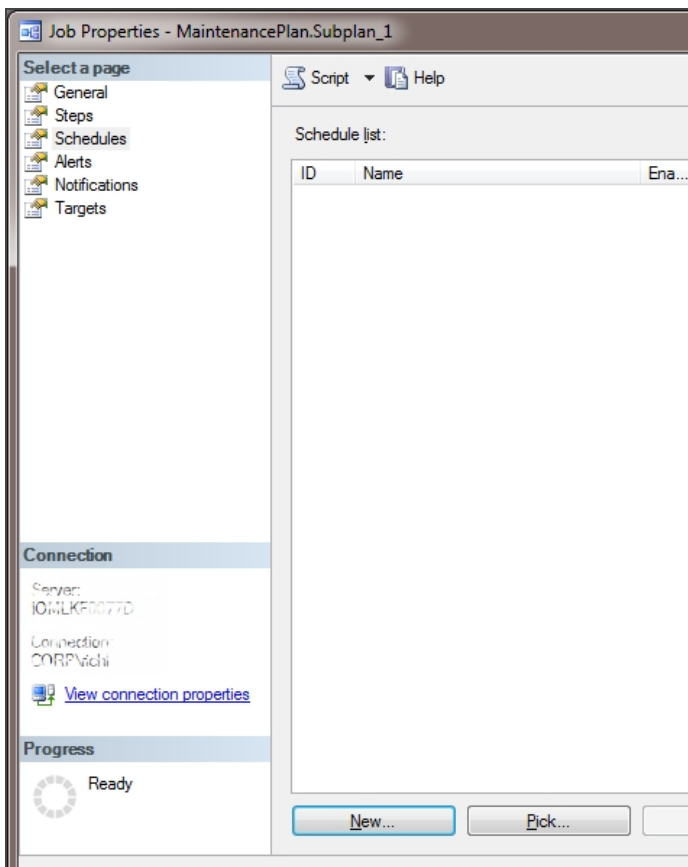


Figure 20: Create a New Job Schedule

2. Set up the schedule according to your needs.

New Job Schedule

Name:

Maintenance

Jobs in Schedule

Schedule type:

Recurring

Enabled

One-time occurrence

Date:

2/24/2012

Time:

2:33:10 PM

Frequency

Occurs:

Weekly

Recur every:

1

week(s) on

Monday

Wednesday

Friday

Saturday

Tuesday

Thursday

Sunday

Daily frequency

Occurs once at:

3:00:00 AM

Occurs every:

1

hour(s)

Starting at:

12:00:00 AM

Ending at:

11:59:59 PM

Duration

Start date:

2/24/2012

End date:

2/24/2012

No end date:

Summary

Description:

Occurs every week on Sunday at 3:00:00 AM. Schedule will be used starting on 2/24/2012.

OK

Cancel

Help

Figure 21: Job Schedule Configuration