Tech Note 1042 Solving Historian Memory Issue with SQL Server MemToLeave Configuration

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Introduction

MemToLeave is virtual address space (VAS) that SQL Server will leave available for memory allocations for SQL Server processes that are *outside* the SQL Server memory pool.

The memory outside of the memory pool is the area used by SQL Server for loading items, such as extended procedure .dll files, OLE DB providers, and automation objects referenced in Transact-SQL statements. The default memory allocation for MemToLeave is about 380 MB on a 32-bit version of SQL Server.

This *Tech Note* describes solving memory issues with with Historian OLE DB Provider (Wonderware products in general) by determining whether you need to increase the amount of memory allocation for MemToLeave.

Application Versions

- Wonderware Historian Server 2012R2 (version 11.0) and later
- Microsoft SQL Server 2008 SP1 or Microsoft SQL Server 2012

Note: This *Tech Note* assumes you are familiar with Wonderware Historian Server and Microsoft SQL Server. If you have any questions regarding the Microsoft SQL Server or the Operating System, please contact Microsoft Technical support at www.microsoft.com for further assistance.

Symptoms

There are two main indications for assigning more memory to MemToLeave:

1. Warnings, errors or informational messages produced by either SQL Server or the ArchestrA logger, similar to the following:

Database Error (5; ExecuteDetectorSQL: Cannot create a statement object using OLE DB provider "INSQL" for linked server "INSQL".) [Server Name; EventDatabase.cpp; 267 Database Error (5; ExecuteDetectorSQL: The OLE DB provider "INSQL" for linked server "INSQL" reported an error. The provider ran out of memory.) [Server Name; EventDatabase.cpp; 267]

2. If the following T-SQL script shows that the amount of available memory is small for the requirements of your platform.

Determining Maximum Free Memory for MemToLeave

To determine the current memory utilization, use the following T-SQL script (Christian Bolton's Blog) to show maximum free size for the OLEDB provider:

```
WITH VASummary(Size, Reserved, Free) AS
(SELECT
Size = VaDump.Size,
Reserved = SUM(CASE(CONVERT(INT, VaDump.Base)^0)
WHEN 0 THEN 0 ELSE 1 END),
Free = SUM(CASE(CONVERT(INT, VaDump.Base)^0)
WHEN 0 THEN 1 ELSE 0 END)
FROM
SELECT CONVERT(VARBINARY, SUM(region_size_in_bytes))
AS Size, region_allocation_base_address AS Base
FROM sys.dm_os_virtual_address_dump
WHERE region_allocation_base_address <> 0x0
GROUP BY region_allocation_base_address
UNION
SELECT CONVERT (VARBINARY, region_size_in_bytes), region_allocation_base_address
FROM sys.dm_os_virtual_address_dump
WHERE region_allocation_base_address = 0x0
AS VaDump
GROUP BY Size)
SELECT SUM(CONVERT(BIGINT,Size)*Free)/1024 AS [Total avail mem, KB], CAST(MAX(Size) AS BIGINT)/1024 AS [Max free size, KB]
FROM VASummary
WHERE Free <> 0
```

Procedure

If you need to increase the size of the MemToLeave area, you must define the **-g startup parameter** for the SQL Server Service. If you are unsure of how much additional memory to allocate to MemToLeave (or **(memory_to_reserve)**, it is best to increase the default 380MB *in increments*. For example, by increments of 256MB until the warnings or related messages are no longer being generated.

- 1. Click Start/All Programs/Microsoft SQL Server 2008/Configuration Tools/SQL Server Configuration Manager.
- 2. Click SQL Server Services.
- 3. Right-click on the SQL Server (MSSQLSERVER) service and select Properties.
- 4. Click the Advanced tab from the SQL Server (MSSQLSERVER)Properties.
- 5. Scroll down and select Startup Parameters.

Sql Server Configuration Manager							
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😵 SQL Server Configuration Manager (Local)	Nam	2		State	S		
SQL Server Services	SQL Server (MSSQLSERVER) SQL Server Analysis Services (MSSQLSERVER) SQL Server Reporting Services (MSSQLSERVER)			Running	A		
SQL Server Network Configuration (32bit)				Running	A		
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	<mark>ء</mark> 50	SQL Server (MSSQLSERVER) Properties					
	li i	og On Service FILESTREAM	Advanced				
	Ιr	Dump Directory	C:\Progra	m Files (x86) Microso	ft s 🔺		
		Error Reporting	No				
		File Version	2007.100	.5512.0			
		Install Path	c: \Progra	m Files (x86)∦Microso	ft S		
		Instance ID	MSSQL10	.MSSQLSERVER			
		Language	1033				
		Registry Root	Software	Wow6432Node Micro	osof		
		Running under 64 bit OS	Yes		_		
		Service Pack Level	3		- 1		
		SQL States	2053	3			
		Startup Parameters	-dC:\Prog	ram Files (x86)\Micro	-		
		Stock Keeping Unit ID	-1534726	760	- 1		
		Stock Keeping Unit Name	Standard	Edition	_		
		Version	10.3.550	0.0	- 11		
	1.11	Virtual Server Name					
		Startup Parameters Parameters used by SQL Server OK	at service star	tup Apply H	lelp		

FIGURE 1: STARTUP PARAMETERS

6. Click the drop-down arrow and add the parameter ;-g512 to the end of the startup parameters.

Dump Directory	C:\Program Files (x86)\Microsoft S	
Error Reporting	No	
File Version	2007.100.5512.0	
Install Path	c:\Program Files (x86)\Microsoft S	
Instance ID	MSSQL10.MSSQLSERVER	
Language	1033	
Registry Root	Software\Wow6432Node\Microsof	
Running under 64 bit OS	Yes	
Service Pack Level	3	
SQL States	2053	
Startup Parameters	-dC:\Program Files (x86)\Micro 👻	
Stock Keeping Unit ID	-dC:\Program Files (x86)\Microsoft SQL Server\MSSQL10.MSSQLSERVER	ξ
Stock Keeping Unit Name	WSSQL\DATA\master.mdf;-eC:\Program Files (x86)\Microsoft SQL Serv	er
Version	(x86) Microsoft SOL Server 4550L 10 MSSOL SERVER MSSOL DATA	
Virtual Server Name	\mastlog.ldf;-g512	
artup Parameters ameters used by SQL Server	at service startup	

FIGURE 2: ADD -G512 TO THE STARTUP PARAMENTERS

- 7. Click OK.
- 8. Right-click the SQL Server (MSSQLSERVER) service and click Restart.
- B. Nguyen

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