

A Mariner White Paper

MARINER

Why Upgrade to SQL 2008 R2 for DBAs

By Wayne Snyder, Distinguished Architect

2719 Coltsgate Road • Charlotte, NC 28211

tel. 704.540-9500 • fax. 704.540-9501

web. mariner-usa.com

MARINER © 2011 ALL RIGHTS RESERVED.

Contents

CONTENTS	2
INTRODUCTION	3
MANAGEABILITY	3
DATA COLLECTOR AND MANAGEMENT DATA WAREHOUSE	3
SQL SERVER UTILITY	4
SQL SERVER MANAGEMENT STUDIO	4
POLICY BASED MANAGEMENT	5
SCALABILITY AND PERFORMANCE	6
RESOURCE GOVERNOR	6
STAR JOIN OPTIMIZATION	7
FILTERED INDEXES AND STATISTICS	7
CONCLUSION	8
ABOUT THE AUTHOR	8

Introduction

SQL Server 2008 R2 has been out for a while now, so it's about time for even the slow adopters to begin moving to the newer software. This is a list of the most important and compelling reasons to upgrade - from a DBA viewpoint.

SQL Server 2008 R2 is described as a "minor version upgrade" on Books On Line for SQL <http://msdn.microsoft.com/en-us/library/ms130214.aspx>. There are some features which make upgrading from SQL 2008 worthwhile. If you are using SQL 2005, there are tons of reasons to move forward.

Manageability

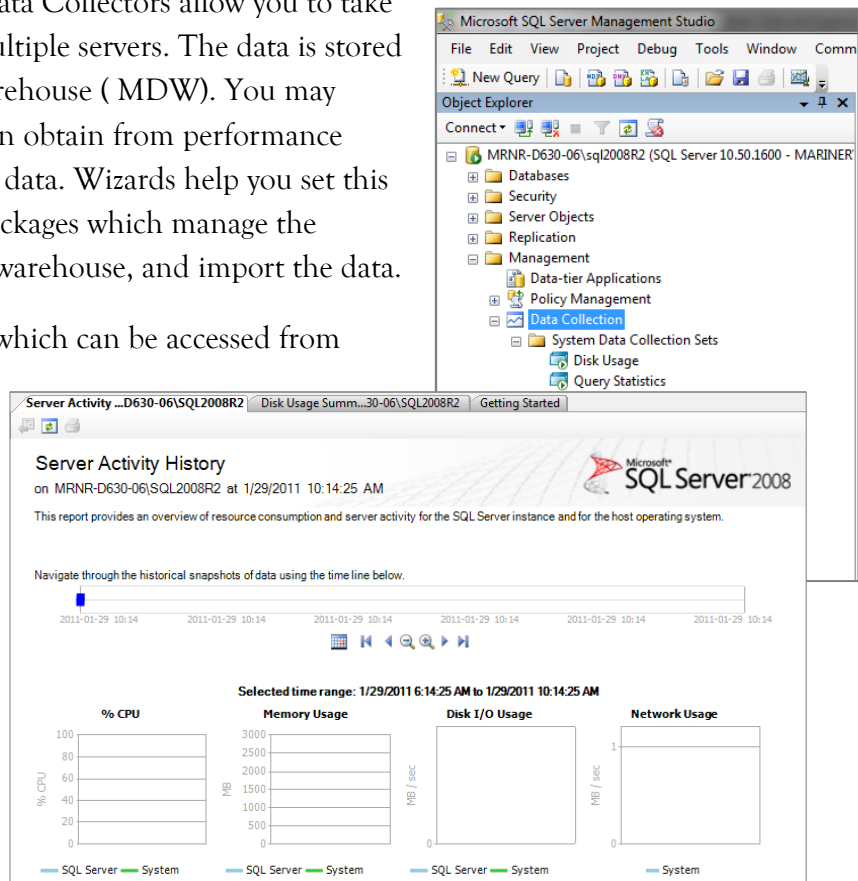
The SQL Server product group at Microsoft is moving steadily toward providing better manageability features in the product which allow us to administer more instances, more databases - all more easily.

Data Collector and Management Data Warehouse

Introduced in SQL Server 2008, Data Collectors allow you to take a snapshot of information from multiple servers. The data is stored in a central Management Data Warehouse (MDW). You may collect any information that you can obtain from performance counters, T-SQL queries, and trace data. Wizards help you set this up. It automatically creates SSIS packages which manage the capture files, upload them to your warehouse, and import the data.

There are several standard reports which can be accessed from Management Studio. You can see the Server Activity History report included here.

Because both trace and performance monitor items can be collected you can also monitor SSAS servers as well.



SQL Server Utility

The Utility Control Point allows you to view SQL 2008 R2 instances of SQL, data-tier applications, database files, and storage volumes. The Utility in R2 uses the infrastructure for Data Collectors mentioned previously. You create a Utility Control Point on an instance of SQL Server 2008 R2, and can monitor other instances of SQL Server 2008 R2.

You can monitor CPU and storage space utilization for each SQL instance as well as at the server level. All of the data captured using the Utility is stored in the central Data Management Warehouse.

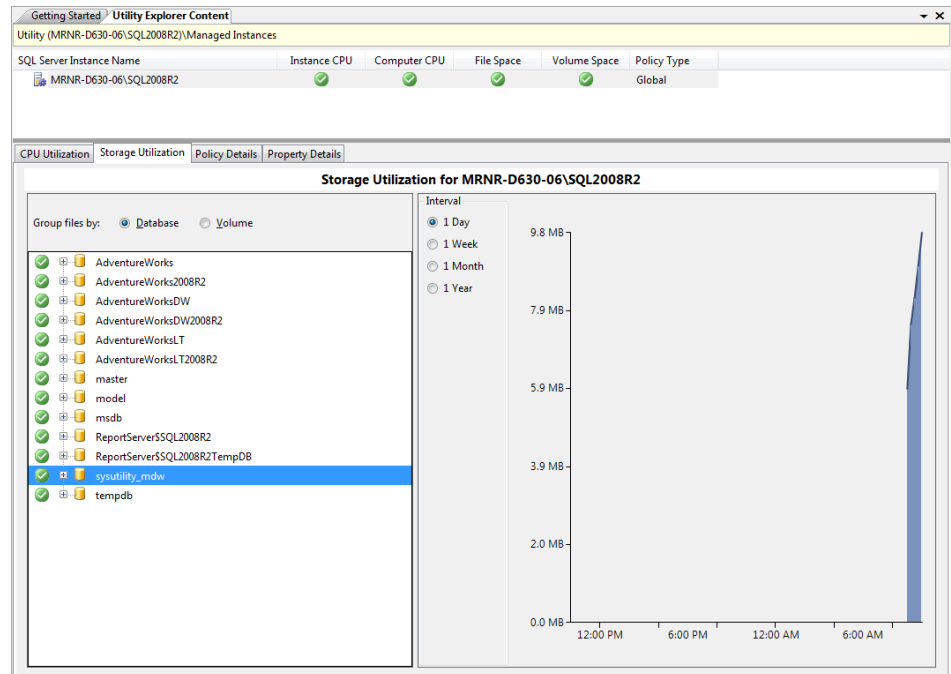
You may set policies, which are actually Key Performance Indicators (KPIs) establishing levels for over utilization and under utilization for any of the four resources, CPU, and disk for the SQL Server instance, and CPU and disk for the server.

The Utility provides some very useful dashboards, which allows you to see the health of your servers, as measured by the Utility.

Utility is restricted to R2 instances, so it doesn't include SQL 2008 and SQL 2005. Still, it is a good start.

SQL Server Management Studio

SQL Server 2008 introduced the concept of **Central Management Servers and Server Groups**. One function I use all the time is the **multi-server queries**, the ability to execute a single query across multiple servers, and have the results aggregated into a single result set. I do this all the time, and when you have to do the same thing on many servers – this is a huge time-saver. New wizards and dashboards are also part of R2.



Policy Based Management

Policy Based Management allows you to create policies to define acceptable conditions on one or more servers. You can make policies optional or required. Policy compliance can be checked, violations can be prevented, and in some cases, you can even automatically force a server into compliance.

There are several evaluation modes:

- On Demand
- On Change:Prevent
- On Change:Log Only
- On Scheduled

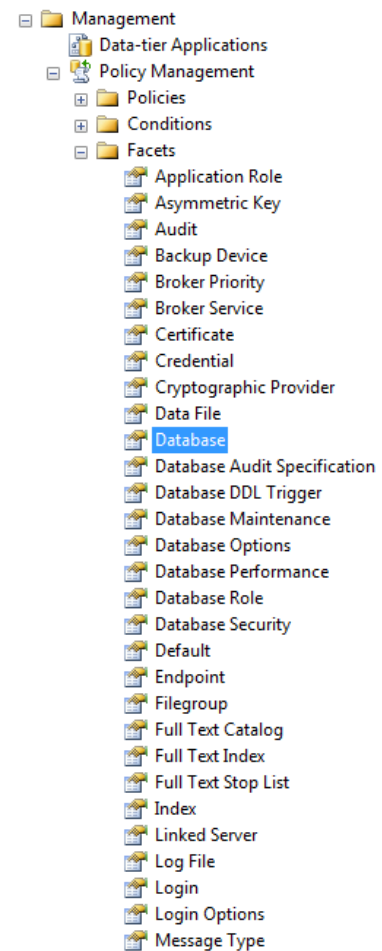
Notifications may also be setup to inform you when policies are violated.

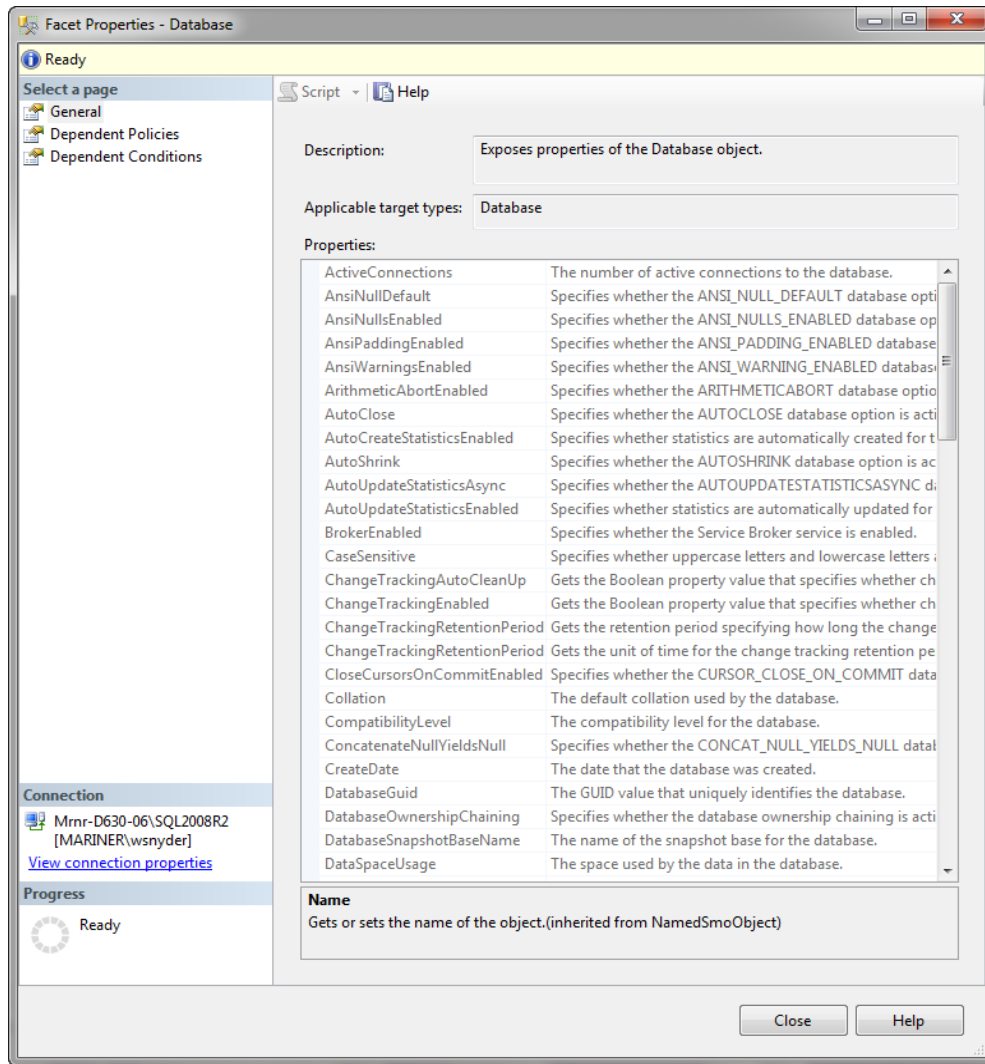
Item Groupings are called facets.

Each facet will have multiple properties, which you can use in your policies. There are hundreds of these items. However, almost all facets are related to the SQL engine, and not SQL Server Integration Services (SSIS) or SQL Server Analysis Services (SSAS).

Some common examples of a policy would be:

- Databases must be backed up fully each week
- Naming conventions must be followed
- DBMail must not be implemented



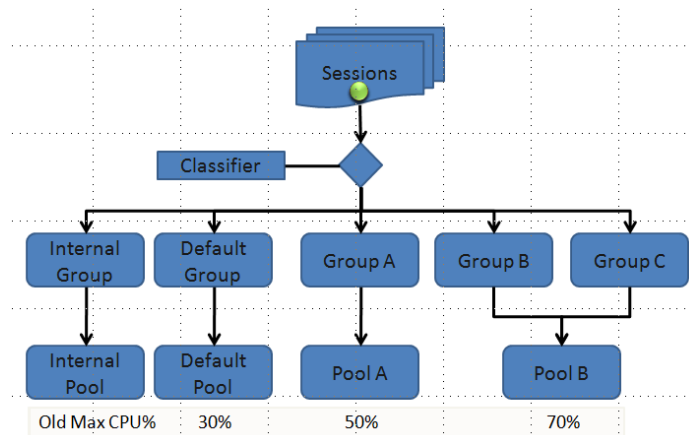


Scalability and Performance

The product developers at Microsoft are continuing their push for higher scalability and better performance with this release. We will focus on a few that I consider especially relevant. The first is Resource Governor which could also be classified as a manageability improvement. I also consider this a scalability enhancement, allowing DBAs to scale their ability to manage larger numbers of SQL Servers easily.

Resource Governor

The Resource Governor allows you to segment workloads into groups, and



allocate memory and processor resources to those groups. This is useful when you have different workload types using the same instance of SQL Server. An example of this is a mixed-use server which contains both OLTP and a data warehouse or reporting users. You create workload groups, and assign resource pools to those groups. Priorities may also be assigned. When each new connection arrives, it is assigned to a workload using a stored procedure which you write.

Additionally, you can monitor resource utilization by each workload.

As the diagram shows, each new session goes through a classifier function which assigns it to a workload group. Workload groups have been pre-defined, and are associated with a resource pool. The resource pool is a container with resource definitions associated with it.

Star Join Optimization

When your database contains star schemas, often used in data warehouses, you may benefit from a special star join optimization technique in SQL Server 2008. Microsoft reports that many data warehouse see a 15% to 25% performance improvement for relational query workloads. Some queries may see a 7X performance increase. This improvement comes with the Enterprise Edition of SQL Server. You do not have to do anything special for this to happen. This optimization is done automatically.

Filtered Indexes and Statistics

In prior releases of SQL Server, all indexes included all table rows. You can now create an index with a “where” clause, which includes only those rows which satisfy the “where” clause in the index. Filtered indexes will be smaller. Smaller indexes mean quicker maintenance on the indexes. Remember that the optimizer uses index statistics to determine the query plan. When you filter an index to target a specific set of rows, the statistics for that index will be better than statistics which cover all of the rows in the table. This means the optimizer has a better opportunity to provide better query plans.

Tables which have a large number of rows with nulls in a column which is often queried, might be a good candidate for a filtered index. I once worked for a mortgage lender who had a terrible problem with lookups on properties which were in foreclosure. There was an attorney field in the loans table. This was left null, until a lawyer was assigned, which came late in the process. So the field was mostly null, and there were tons of rows in this table. A filtered index on the non-null rows would have solved the lookup problem quickly.

In addition to the items, there are improvements with lock escalation, parallel query on partitioned objects and enhanced query plan guides.

Conclusion

If you are thinking about upgrading, ensure that the features you need are included in the version you plan to use. Some of the high performance, high availability, and disaster recovery features are only included in the Enterprise Edition of SQL Server.

This is only a small sampling of new items in SQL Server 2008. I've highlight the things which I personally like. To see more, go to Books On Line for SQL at <http://msdn.microsoft.com/en-us/library/ms130214.aspx> and search for "what's new."

SQL Server R2 has been out for a while now, so it has been in production for a long while at many sites. It's safe, reliable and stable.

My wish for you is success and happiness, whatever you choose to do.

About the Author



Wayne Snyder is Mariner's Distinguish Architect and is one of the most sought out database experts. With more than 30 years of experience and a long-time Microsoft Most Valued Professional, Wayne works directly with Fortune 1000 companies, architecting comprehensive business intelligence solutions. He regularly contributes as a technical writer to SQL Server publications and co-wrote [Wrox SQL 2008 Professional Database Administration](#). Wayne is also the leading SQL Server trainer for [LearnKey](#), a global provider of self-paced online and offline training. As an active member, speaker and leader in the SQL Server community and past president of the Professional Association of SQL Server (www.sqlpass.org), Wayne also manages a website dedicated to SQL Server, www.msbcntral.com. Connect with Wayne on [LinkedIn](#) or follow him on @SQLWayne on Twitter. When he's not in front of his computer keyboard, he's playing keyboards and singing with [Soundbarrier](#).