Don’t Overlook SQL Server 2008 R2

SQL Server 2008 R2 is not a minor point release of SQL Server and should not be overlooked; it is a new version full of enhancements and features if you are an IT administrator or DBA, or are doing BI. SQL Server 2008 R2 should be your first choice when it comes to choosing a version of SQL Server to use for future deployments. By building on the strong foundation of SQL Server 2008, SQL Server 2008 R2 allows you to do the DBA to derive even more insight into the health and status of your environments without relying on custom code or third-party utilities—and there is an edition that meets your performance and availability needs for mission-critical work, as well.

Allan Hirt has been using SQL Server in various guises since 1992. For the past 10 years, he has been consulting, training, developing, communicating, authoring books, whitepapers, and articles. His most recent major publications include the book Pro SQL Server 2005 High Availability (Apress, 2007) and various articles for SQL Server Magazine. Before striking out on his own in 2007, he most recently worked for both Microsoft and Avanade, and still continues to work closely with Microsoft on various projects. He can be reached via his website at http://www.sqlha.com or at allan@sqlha.com.

Editions and Licensing

SQL Server includes three new editions: Datacenter and Parallel Data Warehouse. I will discuss Parallel Data Warehouse later in the BI Enhancements in SQL Server 2008 R2.

SQL Server 2008 R2 Datacenter builds on the vast capabilities of SQL Server 2008, but is tailored for those who need the ultimate flexibility for deployments, as well as advanced scalability for things such as virtualization and large applications. For more information about scalability, see the section called “More Mission-Critical中铁.” SQL Server 2008 R2 also will include an increase in the per-processor pricing for SQL Server 2008 R2 by 15 percent for the Enterprise Edition and 25 percent for the Standard Edition. There will be no change to the price of the server or CAL licensing model. The new retail price is shown in Table 1. Licensing is always a key consideration when you are planning to deploy a new version of SQL Server. Two things have not changed when it comes to licensing for SQL Server 2008 R2.

• The per-server/client access model pricing for SQL Server 2008 R2 Standard and Enterprise has not changed. If you use that pricing for your deployments, the change in pricing for the per-processor licensing will not affect you. That’s a key point to take away.

• SQL Server licensing is based on sockets, not cores. A socket is a physical processor. For example, if a server has four physical processors, each with eight cores, and you set up two instances, your cost would be $114,996. If Microsoft charged per core, the cost would be an astronomical $919,968. Some of Microsoft’s competitors do charge per core, so keep in mind that as you decide on your database platform and consider which licensing will cost over its lifetime.

Table 1: SQL Server 2008 R2 retail pricing

<table>
<thead>
<tr>
<th>Edition</th>
<th>Per Processor in US dollars</th>
<th>Per Server + Client Access Licenses in US dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>$7,499</td>
<td>$1,400 with CALs</td>
</tr>
<tr>
<td>Enterprise</td>
<td>$8,749</td>
<td>$1,400 with CALs</td>
</tr>
<tr>
<td>Datacenter</td>
<td>$17,496</td>
<td>Not available</td>
</tr>
<tr>
<td>Parallel Data Warehouse</td>
<td>$17,496</td>
<td>Not available</td>
</tr>
</tbody>
</table>

BI Enhancements in SQL Server 2008 R2

The BI enhancements in SQL Server 2008 R2, SQL Server 2008 R2 Parallel Data Warehouse, and Microsoft SQL Server Integration Services 2008 R2 have significantly improved SQL Server 2008, but Microsoft has also enhanced the features used for BI. For some of those improvements include:

• SQL Server 2008 R2 Parallel Data Warehouse, shipping later in 2010, makes data warehousing more cost effective, and manage hundreds of terabytes of data and deliver superior performance with parallel data movement and a scale out architecture.

In May 2010, Microsoft is releasing SQL Server 2008 R2. More than just an update to SQL Server 2008, R2 is a brand new version. This technical essential guide will cover all major changes in SQL Server 2008 R2 that DBAs need to know about. For additional information about any SQL Server 2008 R2 features not covered, see http://www.microsoft.com/ datapaper.
time in Visual Studio 2010 (for example, adding a column to a table). In addition, you can redeploy the package using the same standard process as the initial deployment in SQL Server 2008 R2, with minimal to no intervention by IT or DBAs. This capability makes upgrades virtually painless, instead of a process fraught with worry. Certain tasks, such as backup and restore or moving data, are not done via the DAC, they are still done at the database level. You can provide and manage the DAC via the SQL Server Utility. Figure 2 shows what a sample SQL Server Utility architecture with a DAC looks like.

IMPORTANT: Note that DAC can also refer to the dedicated administrator connection, a feature introduced in SQL Server 2005.

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With the capability to leverage commodity hardware and the existing tools, Parallel Data Warehouse (formerly known as “Madison”) becomes the center of a BDP and allows many different sources to connect to it, much like a hub-and-spoke system. Figure 1 shows an example architecture.

- SQL Server 2008 R2 Enterprise and Datacenter ship with Master Data Services, which enables master data management (MDM) for an organization to create a single source of “the truth,” while securing and enabling easy access to the data. To briefly review MDM and its benefits, consider that you have lots of internal data sources, but ultimately you need one source that is the master copy of a given set of data. A Web site sells a product from a catalog, but requires coordination. Such things as a Web site sells a product from a catalog, but

- SQL Server Reporting Services has been greatly enhanced with SQL Server 2008 R2, including improvements to reports via Report Builder 3.0 (e.g., ways to report using geospatial data and to calculate aggregates of aggregates, indicators, and more).

Consolidation and Virtualization
- Consolidation of existing SQL Server instances and databases can take on various flavors and combinations, but the two main categories are physical and virtual. More and more organizations are choosing to virtualize, and choosing the right edition of SQL Server 2008 R2 can save you significantly. A SQL Server 2008 Standard license comes with one virtual machine (VM) license; Enterprise allows up to four. By choosing Datacenter and licensing an entire server, you get the right to deploy as many virtual machines as you want on that server, allowing up to four. By choosing Datacenter and

PowerPivot for SharePoint 2010 is a combination of client and server components that lets end-users use a familiar tool—Excel—to securely and quickly access large internal and external dimensional data sets. PowerPivot brings the power of BI to users and lets them share the information through SharePoint, with automatic refresh built in. No longer does knowledge need to be siloed. For more information, go to http://www.powerpivot.com.

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Consolidation and Virtualization

Consolidation of existing SQL Server instances and databases can take on various flavors and combinations, but the two main categories are physical and virtual. More and more organizations are choosing to virtualize, and choosing the right edition of SQL Server 2008 R2 can make a significant difference. A SQL Server 2008 Standard license comes with one virtual machine license, allowing many different sources to connect to it, and to calculate aggregates of aggregates, indicators, and more.

Management

SQL Server 2008 introduced two key management features: Policy-Based Management and Resource Governor. Policy-Based Management lets you define a set of rules (a policy) based on a specific set of conditions (the condition). A condition is made up of facets (e.g., Database); it then has a behavior property (such as AutoShrink being enabled) that can be evaluated. Consider this example: As DBA, you do not want AutoShrink enabled on any database. AutoShrink can be queued for a database, and if it is enabled, it can either just be reported back as a warning, or be implemented (if desired), or if a certain condition is met (such as AutoShrink being enabled) and that is not your desired condition, it can be disabled automatically once it has been detected. The choice is up to you as the implementer of the policy. You can then roll out the policy and enforce it for all of the SQL Server instances in a given environment. With PowerShell, you can even use Policy-Based Management to manage the SQL Server 2008 R2. It’s a great feature that you can use to enforce compliance and standards in a straightforward way.

Resource Governor is another feature that is important in a post-consolidated environment. It allows you as DBA to ensure that a workload will never bring an instance to its knees, by defining CPU and memory parameters to keep it check—effectively stopping what are known as runaway queries and unpredictable executions. It can also allow a workload to get priority over other workloads, so SQL Server’s accountting application shares an instance with 24 other workloads. You observe that, at the end of the month, performance is poor and that the applications are suffering because of the nature of the work that the applications are doing. You can use Resource Governor to ensure that the accounting application gets priority, but that it doesn’t complete the whole other 24 applications. Be aware that Resource Governor cannot throttle a current implementation and should only be configured if there is no need to use it. If configured where there is no need, it could potentially cause one; so use Resource Governor only if needed. SQL Server 2008 R2 also introduces the SQL Server Utility. The SQL Server Utility gives you as DBA the capability to have a central point of view on what is going on in your instances, and then use that information for proper planning. For example, in a post-consolidated world, if an instance is over- or under-utilized, you can handle it in the proper manner instead of having the problems existed in pre-consolidation. Before SQL Server 2008 R2, the only way to see this kind of data in a database was to code a custom solution or buy a third-party third-party. Trending and tracking databases and instances was potentially very labor and time intensive. To address this issue, the SQL Server Utility is based on setting up a central Utility Control Point that collects and displays data via dashboards. The Utility Control Point builds on Policy-Based Management (mentioned earlier) and the Management Data Warehouse feature that shipped with SQL Server 2008. The Utility Control Point is a process that takes minutes—not hours, days, or weeks, and large-scale deployments can utilize PowerShell to enroll many instances. SQL for example, Server 2008 R2 Enterprise allows you to manage up to 25 instances as part of the SQL Server Utility, and Datacenter has no restrictions.

Besides the SQL Server Utility, SQL Server 2008 R2 introduces the concept of a data-tier application (DAC). A DAC represents a single unit of deployment, or package, which contains all the database objects needed for an application that you can create from existing applications or in Visual Studio if you are a developer. You will then use that package to deploy the database portion of the application via a standard process instead of having a different deployment method for each application. One of the biggest benefits of the DAC is that you can modify it at any
**Consolidation and Virtualization**

Consolidation of existing SQL Server instances and databases can take on various flavors and combinations, but the two main categories are physical and virtual. More and more organizations are choosing to virtualize, and choosing the right edition of SQL Server 2008 R2 can make this significantly easier. A SQL Server 2008 Standard license comes with one virtual machine license; Enterprise Edition licenses can support four virtual machines. By choosing Datacenter and licensing an entire server, you get the right to deploy as many virtual machines as you want on that server.

Management

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Figure 2: Sample SQL Server Utility architecture
time in Visual Studio 2010 (for example, adding a column to a table). In addition, you can redeploy the package using the same standard process as the initial deployment in SQL Server 2008 R2; for minimal to no intervention by IT or the DBA. This capability makes upgrades virtually painless, instead of a process fraught with worry. Certain tasks, such as backup and restore or moving data, are not done via the DAC, they are still done at the database level. You can even manage the DAC via the SQL Server Utility. Figure 2 shows what a standard SQL Server Utility architecture with a DAC looks like.

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