

# A GUIDE TO **SQL Server 2012**

**Inside SQL  
Server 2012**

**Top 12 Features  
of SQL Server  
2012**

**SQL Server 2012  
Brings Some  
Price Hikes**



Sponsored By

**idera**

**Redmond**  
THE INDEPENDENT VOICE OF THE MICROSOFT IT COMMUNITY





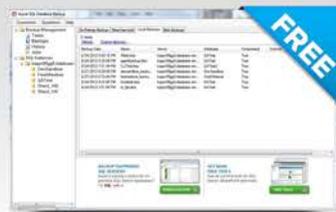
Idera makes tools  
**that make SQL  
do your bidding.**



SQL job manager



SQL permissions extractor



SQL fragmentation analyzer



SQL backup status reporter

**4 Free Tools** to help you master SQL

**Try them all for FREE**

<http://tinyurl.com/SQL4Free>

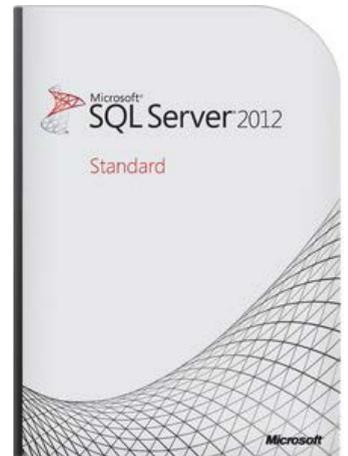
Part of **idera free**

IT tools you'd pay to use (but never need to).

# Inside SQL Server 2012

SQL Server 2012 offers a variety of new features centered on big data, business intelligence and cloud computing.

■ By Kurt Mackie



**F**ollowing the April 1 release of SQL Server 2012, Microsoft is touting the product's ability to handle "mission critical" operations in terms of performance, scale, security, high availability and disaster recovery. Additionally, Microsoft claims that SQL Server 2012 users have access to the "cloud on your terms" with SQL Server 2012, either private clouds (via virtualization and management) or public clouds (via SQL Azure).

The management part of the private cloud deployments is linked to Microsoft's System Center 2012 suite, where it is possible to deploy private clouds using a wizard in Virtual Machine Manager. Microsoft also has tools to synchronize and move data back and forth between private and public clouds with its [Data Sync technology](#). Data Sync enables bidirectional synchronization and is currently at the technology preview stage, said Doug Leland, general manager of Microsoft's business platform marketing group, in a phone interview on Monday. Finally, SQL Server 2012 is optimized to produce "breaking insights," in part because of its leveraging of "big data" and Microsoft's tools.

## Big Data and Hadoop

Leland noted three general trends that accompany this release of SQL Server. First, there is the data explosion, particularly with the use of unstructured data. Next, he cited a reduction in cost and computing that is "reshaping data processing." He described it as the "save everything era," allowing organizations to save signals data and even data in the wild and attain insight

from them. Finally, he said that there has been a wave of innovation that is creating new business models. He described SQL Server 2012 as the platform designed to "embrace structured and unstructured data" and "unlock insights."

Microsoft previously announced its "big data" embrace at the October PASS meeting, where the company committed to backing open source Apache Hadoop as a core component of its data platform and enabling [interoperability with Windows Azure and Windows Server](#). Now, Microsoft is announcing a second preview for Apache Hadoop that will add new features and expand its capacity. It will be a new technical preview available by invitation only, according to Leland.

An example of a customer using these big data technologies is Klout, which offers a service that ranks influence on social media sites such as Twitter, Facebook and others. From a registered population of 100 million, Klout collect billions of signals across social media sites. The traffic is captured in Hadoop and moved into SQL Server Analysis Services, and the query results are graphed via PowerPivot and Power View. SQL Server Analysis Services provides the multidimensional online analysis processing (MOAP), while the Excel's PowerPivot and Power View provide the front-end tools that empower data workers, Leland explained.

Saptak Sen, a Microsoft senior product manager, explained that Hadoop allows users to apply a structure to unstructured data at query time. He said that most people use Hadoop as a "cheap shoebox" and create a product out of a cache flow. For instance, he described a medical company that used Hadoop

to flag certain claims instead of using personnel to process forms. Yahoo uses Hadoop to process clickstream data to determine what sort of ad categories to create. They create cubes of data with a single cube consisting of 24 terabytes, he said.

## Xvelocity Technologies

Microsoft has a family of in-memory technologies, called “Xvelocity,” for SQL Server 2012 that Microsoft depicts as enabling fast query processing. Leland said that the technology has enabled “dramatic” speed improvements among customers testing SQL Server 2012. Xvelocity is for business intelligence (BI) and data warehousing uses.

One of those Xvelocity-branded technologies is ColumnStore Indexing, which “grabs your tables and makes them into a column,” according to Dandy Weyn, a Microsoft senior technology product manager, at the workshop. The columns get cached in memory. He said that ColumnStore Indexing, which is a read-only feature, takes up less space than a row-based index and uses compression via Microsoft’s VertiPaq technology to speed up performance. ColumnStore Indexing is specifically designed for data warehouse applications. Weyn said that it can be compared with Oracle’s column-store compression technology, but “you’d need to have a full rack appliance to take advantage of the techniques needed for data warehousing.”

Microsoft’s ColumnStore Indexing is not supported on SQL Azure yet, according to Greg Leake, a technical product manager on the SQL Server marketing team. It’s available to users of Enterprise edition of SQL Server 2012.

## AlwaysOn Technologies

AlwaysOn isn’t a specific feature in SQL Server 2012. It’s Microsoft’s branding for high availability and disaster recovery technologies, according to [Aaron Bertrand](#), a Microsoft MVP. Those technologies include “failover clustering,” “availability groups,” and “active secondaries,” among others.

SQL Server 2012 has “native support for failover clustering,” according to Weyn. It supports multisubnet clustering, where nodes will use an “OR” subset that will allow a failover to another subnet node.

Availability groups provide protection at the database level. It’s an alternative to database mirroring. Multiple databases can be grouped together into an availability group. Users specify an availability group “listener,” which will move over to another server if the first server fails, Weyn explained. Users need to specify failover clustering for this technology to work, he added. Availability groups can specify active secondaries, which are used for “offloading read workloads to a secondary instance,” according to Microsoft’s [AlwaysOn FAQ](#). It is possible to have multiple availability groups on a single server, and you can have multiple secondaries too. AlwaysOn can be enabled using PowerShell scripts and it is possible for users to define their failover policies, Weyn said.

## Development and Management Tools

Microsoft is releasing SQL Server Data Tools with SQL Server 2012. Those tools are free, but if users already have

Visual Studio, SQL Server Data Tools will “meld seamlessly within that installation in Visual Studio 2010,” Leake said. The tools will support versioning and team-based development. Moreover, they work with any past editions of SQL Server, Leake added. The tools work both with on-premises installations of SQL Server and with the cloud-based SQL Azure. It’s also possible to disconnect from the network and use LocalDB, an in-memory database, and then upload any changes later to the live database, he explained.

SQL Server Data Tools include a new SQL Server object explorer, a SQL language service, buffered declarative editing, a table designer (with “intellisense” code completion) and an isolated local database runtime, Leake explained. The tools follow the SQL Azure release cycle, so they will be updated every three to four months, he added. SQL Server Data Tools are designed for database administrators and developers. Microsoft also has a tool for systems operators called “SQL Server Management Studio.” This sys-op toolset is only available to those with the developer edition; it’s not available with the Express edition.

In addition, Microsoft recently released a new management pack for SQL Azure that adds management capabilities, Leake said. Microsoft has a Web based management portal that works with Windows Azure, which will produce “rich cloud-based data reports.” SQL Azure is based on the SQL Server 2012 engine, Leake explained.

At the workshop, Leake was asked about modeling in SQL Server Data Tools. He said that “our team is not moving into the database modeling area” and that it was “opened up for third parties” to address that capability. Another question was about the status of “[Project Barcelona](#),” a Microsoft effort to enable metadata management in SQL Server. Leake said that the team is still working on Project Barcelona but that those capabilities will not ship with SQL Server 2012.

## Business Intelligence Tools

The two main tools for BI that work with SQL Server 2012 are the Excel 2010-based PowerPivot and Power View. The later tool is an “interactive visualization program based on *ad hoc* queries,” according to Sean Boon, a senior program manager for SQL Server business intelligence. A Microsoft [TechNet article](#) describes Power View as a “Reporting Services Add-in for Microsoft SharePoint Server 2010 Enterprise Edition.” It’s browser-based, using Silverlight, and gets “launched from SharePoint Server 2010.”

PowerPivot is an Excel 2010 addition for BI purposes that’s designed for “Excel users who know how to structure, analyze, and calculate multidimensional data in workbooks and PivotTables,” according to [an MSDN description](#).

Both tools connect with SQL Server Reporting Services and integrate with SharePoint 2010 for data sharing. SharePoint isn’t required to use PowerPivot, but Microsoft conceives of SharePoint as a way to control data within an organization. It’s possible to open a PowerPivot workbook in a browser via Excel Web access or a SharePoint WebPart, according to Boon.

IT pros can use a dashboard to monitor PowerPivot on SharePoint to check for CPU usage. It can be tracked over time, so that heavily used items can be flagged to become a managed item, Boon explained.

IT pros can also create alerts on data for Power View. They can set up execution logs devoted to the alerts. Power View is designed to create interactive reports quickly. "It's really about asking questions and being able to present that data and having a high level of interactivity," Boon said. Power View has an "Office-like look and feel" in a browser, he added. The data visualizations also are fully interactive after being exported to the Microsoft PowerPoint presentation program. Users get a link in PowerPoint called "click to interact" that enables this interactive capability.

SQL Server 2012 includes a number of services to help clean up the data. A data quality services feature allows users to correct data. For instance, the abbreviation, "in.," can

be standardized as "inch." SQL Server 2012 also has master data services, which is used to categorize objects, such as "products" and "customers." It's designed for data that doesn't change too often. Both of those services are maintained through SQL Server 2012's integration services. Microsoft also has a data quality services in SQL Server 2012 that is "a knowledge-driven data quality solution." For instance, it can be set to determine that if the city is Los Angeles, then the state should be California, Boon explained.

While SQL Server 2012 handles various data feeds, it's also possible to connect with Microsoft's [Windows Azure Marketplace](#) or third-party data reference providers. Microsoft's marketplace is a portal that sells data feeds, which can be used to supplement a data mashup. **R**

*Kurt Mackie is online news editor, Enterprise Group, at 1105 Media Inc.*

# TOP 12 Features of SQL Server 2012

Microsoft has introduced SQL Server 2012 to the world and it's time for IT professionals to start to come to speed on what's new. **R** By Joey D'Antoni

**M**icrosoft has introduced SQL Server 2012 to the world and it's time for IT professionals to start to come to speed on what's new in this highly anticipated version of SQL Server.

## 1. AlwaysOn Availability Groups

This feature takes database mirroring to a whole new level. With AlwaysOn, users will be able to fail over multiple databases in groups instead of individually. Also, secondary copies will be readable, and can be used for database

backups. The big win is that your DR environment no longer needs to sit idle.

## 2. Windows Server Core Support

If you don't know what Windows Server Core is, you may want to come up to speed before Windows 8 (MS is making a push back to the command line for server products). Core is the GUI-less version of Windows that uses DOS and PowerShell for user interaction. It has a much lower footprint (50% less memory and disk space utilization), requires fewer

patches, and is more secure than the full install. Starting with SQL 2012, it is supported for SQL Server.

### 3. Columnstore Indexes

This is a cool new feature that is completely unique to SQL Server. They are a special type of read-only index designed to be used with Data Warehouse queries. Basically, data is grouped and stored in a flat, compressed column index, greatly reducing I/O and memory utilization on large queries.

### 4. User-Defined Server Roles

DBAs have always had the ability to create custom database roles, but never server wide. For example, if the DBA wanted to give a development team read/write access to every database on a shared server, traditionally the only ways to do it were either manually, or using undocumented procedures. Neither of which were good solutions. Now, the DBA can create a role, which has read/write access on every DB on the server, or any other custom server wide role.

### 5. Enhanced Auditing Features

Audit is now available in all editions of SQL Server. Additionally, users can define custom audit specifications to write custom events into the audit log. New filtering features give greater flexibility in choosing which events to write to the log.

### 6. BI Semantic Model

This is replacing the Analysis Services Unified Dimensional Model (or cubes most people referred to them). It's a hybrid model that allows one data model will support all BI experiences in SQL Server. Additionally, this will allow for some really neat text infographics.

### 7. Sequence Objects

For those folks who have worked with Oracle, this has been a long requested feature. A sequence is just an object that is a counter—a good example of its use would be to increment values in a table, based on a trigger. SQL has always had similar functionality with identity columns, but now this is a discrete object.

### 8. Enhanced PowerShell Support

Windows and SQL Server admins should definitely start brushing up on their PowerShell scripting skills. Microsoft is driving a lot of development effort into instrumenting all of their server-based products with PowerShell. SQL 2008 gave DBAs some exposure to it, but there are many more in cmdlets in SQL 2012.

### 9. Distributed Replay

Once again this is an answer to a feature that Oracle released (Real Application Testing). However, and in my opinion where the real value proposition of SQL Server is, in Oracle it is a (very expensive) cost option to Enterprise Edition. With SQL, when you buy your licenses for Enterprise Edition, you get everything. Distributed replay allows you to capture a workload on a production server, and replay it on another machine. This way changes in underlying schemas, support packs, or hardware changes can be tested under production conditions.

### 10. PowerView

You may have heard of this under the name “Project Crescent” it is a fairly powerful self-service BI toolkit that allows users to create mash ups of BI reports from all over the Enterprise.

### 11. SQL Azure Enhancements

These don't really go directly with the release of SQL 2012, but Microsoft is making some key enhancements to SQL Azure. Reporting Services for Azure will be available, along with backup to the Windows Azure data store, which is a huge enhancement. The maximum size of an Azure database is now up to 150G. Also Azure data sync allows a better hybrid model of cloud and on-premise solutions.

### 12. Big Data Support

I saved the biggest for last, introduced at the PASS (Professional Association for SQL Server) conference last year, Microsoft announced a partnership with Hadoop provider Cloudera. One part of this involves MS releasing an ODBC driver for SQL Server that will run on a Linux platform. Additionally, Microsoft is building connectors for Hadoop, which is an extremely popular NoSQL platform. With this announcement, Microsoft has made a clear move into this very rapidly growing space.

SQL 2012 is a big step forward for Microsoft—the company is positioning itself to be a leader in availability and in the growing area of big data. As a database professional, I look forward to using SQL 2012 to bring new solutions to my clients. **R**

---

*Joey D'Antoni is a Principal Infrastructure Architect for a major telecommunications provider. He has nearly 15 years of IT experience working for multiple Fortune 500 companies in a wide variety of database and major project roles. He holds a bachelor degree from Louisiana Tech University and a MBA from North Carolina State University. Joey is an avid cook and cyclist.*

# SQL Server 2012

## Brings Some Price Hikes

■ By Kurt Mackie

**S**QL Server is more expensive, and licensing of the product isn't much less complicated than it was before. In the document "SQL Server 2012 Licensing Quick Reference Guide," released last spring, Microsoft provided a nuanced picture of how to assess the product's licensing costs. Microsoft switched the licensing basis from counting processors to counting cores with SQL Server 2012. However, even though Microsoft has attempted to simplify the licensing with this release, calculating the costs will be an undertaking for organizations.

Microsoft moved to the cores pricing model largely to match its competition and customer demands, according to Wes Miller, an analyst with Directions on Microsoft.

"Cores are something that Microsoft elected to not focus on previously," Miller explained in a recent "Licensing SQL Server" presentation. "But a lot of rest of the software ecosystem has focused on it -- and, in fact, companies have been a lot more aggressive with Microsoft about trying to compensate for cores. And so this is Microsoft fixing a bit of a licensing hole."

He explained that the goal of IT departments in adding more cores is to increase performance without having to increase the clock speed to account for thermal issues within a processor.

### Products and Pricing

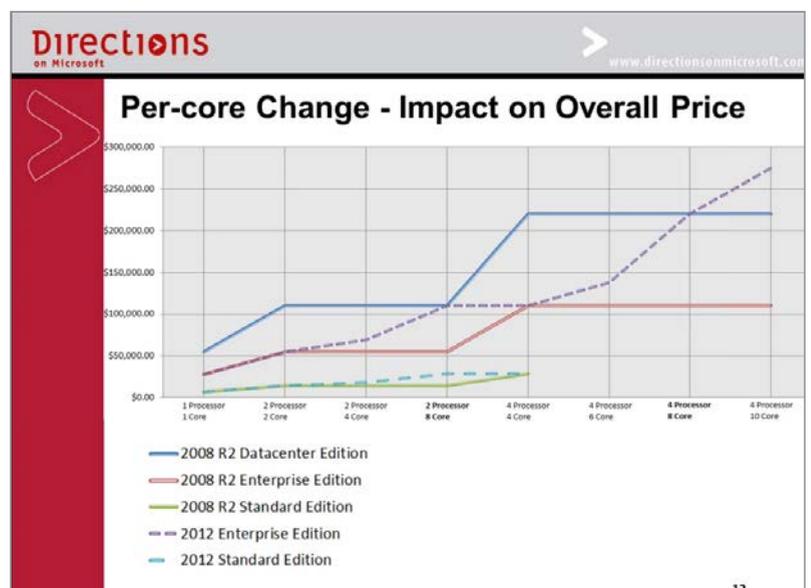
The licensing and pricing models vary based on the edition purchased. SQL Server 2012 has three editions or "product SKUs." The Enterprise edition is licensed on a cores basis only. The Business Intelligence edition is licensed on a server plus Client Access License (CAL) basis only. Lastly, the Standard edition is available either on a cores basis or it can be purchased according to the server plus CAL model.

According to Directions on Microsoft, the Enterprise edition licensing for SQL Server 2012

is priced at \$6,874 per core. Business Intelligence edition licensing is priced at \$8,592 per server plus \$209 CALs per each user or device. The costs for Standard edition licensing are \$1,793 per core, or \$898 per server plus \$209 CALs per each user or device. Those price estimates are described as being at the "open, no-level" state, which represents the highest prices that customers can pay, according to Miller.

Compared with SQL Server 2008 R2 pricing, organizations that have machines with more than four cores per processor can expect steeper pricing with the Enterprise edition of SQL Server 2012. The difference amounts to pricing increases in the tens of thousands of dollars, depending on the cores licensed (see chart).

Regardless of the number of cores in the machine, Microsoft's basic unit for licensing is set at four cores per processor. The licensing is sold in two-core packs. IT pros count the



SQL Server core pricing.

Source: Directions on Microsoft Webinar, March 22, 2012.

cores and multiply it by a “core factor” found in Microsoft’s SQL Server 2012 “Core Factor Table.” Next, that number gets divided in two because the licensing is sold in two-core packs. The resulting figure is the number of licenses that need to be purchased from Microsoft or its partners.

## Licensing Deadlines

Timing is important in addressing the licensing costs. The timing is different for organizations with Enterprise Agreement (EA) or Enrollment for Application Platform (EAP) contracts. They can buy per-processor licensing with SA for years before their agreements end. However, at the end of that term, these licensees also will have to convert to core licensing with SA. These contracts typically have three-year terms, so the EA and EAP options will end in 2015, noted [Rob Horwitz](#), research chair at the [Directions on Microsoft](#).

For those organizations renewing at the end of their SA term, the renewal will get based on cores. Directions on Microsoft recommends that organizations consider implementing a hardware upgrade with the latest core-dense processors before their SA term ends. SA allows organizations to move the processor licensing across different machines, but watch out for Microsoft’s “core equivalency” restriction, Horwitz warned.

“One curveball in the new rules is something called ‘core equivalency,’” he said. “This becomes relevant when you subsequently want to reassign the processor licenses to a different physical server in this scenario—especially reassigning

the licenses to a brand-new server with lots and lots of cores.”

Microsoft essentially locks you into the cores-per-processor ratio that was in place the day before your SA coverage ended. Horwitz said that restriction should provide an incentive for organizations to time their hardware upgrades to happen before the end of their SA terms.

One notable aspect of the new SQL Server 2012 licensing is that the server licensing costs for Standard edition licensees will remain unchanged when compared with the previous SQL Server 2008 R2 server licensing for that edition. Moreover, Standard edition licensees will have the ability to reassign licenses with SA within a server farm every 90 days, which is a new perk. Other editions have this perk, too. Microsoft is generally permitting “[license mobility](#)” across all SQL Server 2012 editions with SA, which means that an organization’s server license could be transferred to a hosting provider, if wanted.

For more resources on SQL Server 2012 licensing, see this [Microsoft overview page](#). A new version of the [Microsoft Assessment and Planning Toolkit](#) is now available that purportedly helps with assessing compliance and the ability to move to SQL Server 2012.

Directions on Microsoft also offers “[boot camp](#)” classes that go through the complexities of Microsoft’s licensing. **R**

*Kurt Mackie is online news editor, Enterprise Group, at 1105 Media Inc.*

## New MAP Toolkit Checks SQL Server 2012 Readiness

Microsoft in July released its latest no-cost network administrator toolkit for Windows environments that’s designed to assess server and operating system migration readiness, as well as to verify licensing and compliance issues.

Version 7.0 of the Microsoft Assessment and Planning Toolkit, which is available for download [here](#), and contains some noteworthy new features.

For instance, organizations assessing a move to SQL Server 2012 or Windows Server 2012 will get licensing information in addition to discovery capabilities from using the tool. A “SQL Server proposal” gets generated from the tool showing licensed editions in a computing environment. In addition, it “will identify the new SQL Server Enterprise Core-based edition and license model,” according to [Microsoft](#).

Microsoft moved to [core-based licensing](#) with SQL Server 2012, instead of the previous processor-based approach. Presumably, the new MAP Toolkit will help with organizational assessment before the next licensing true-up or agreement renewal for those considering the migration. Microsoft is increasing the Client Access License costs for SQL Server 2012 by 25 percent.

Microsoft’s toolkit also can perform inventories on other database management systems, such as Oracle on Itanium servers, MySQL and Sybase. Another new capability in the toolkit is the ability to gather information about moving to the Database Consolidation Appliance, which is a complete hardware and software SQL Server 2012 product. One such product is [currently offered by HP](#).

The toolkit also has a new “Microsoft Private Cloud Fast Track” assessment capability. It describes server consolidation details.

Another new feature in the toolkit is license tracking for devices, which is called an “active devices” feature. Microsoft describes active devices as “a new inventory scenario that allows organizations to report Windows devices that are active on the network.” However, the previous version of the toolkit seemed to have this capability as well.

—K.M.