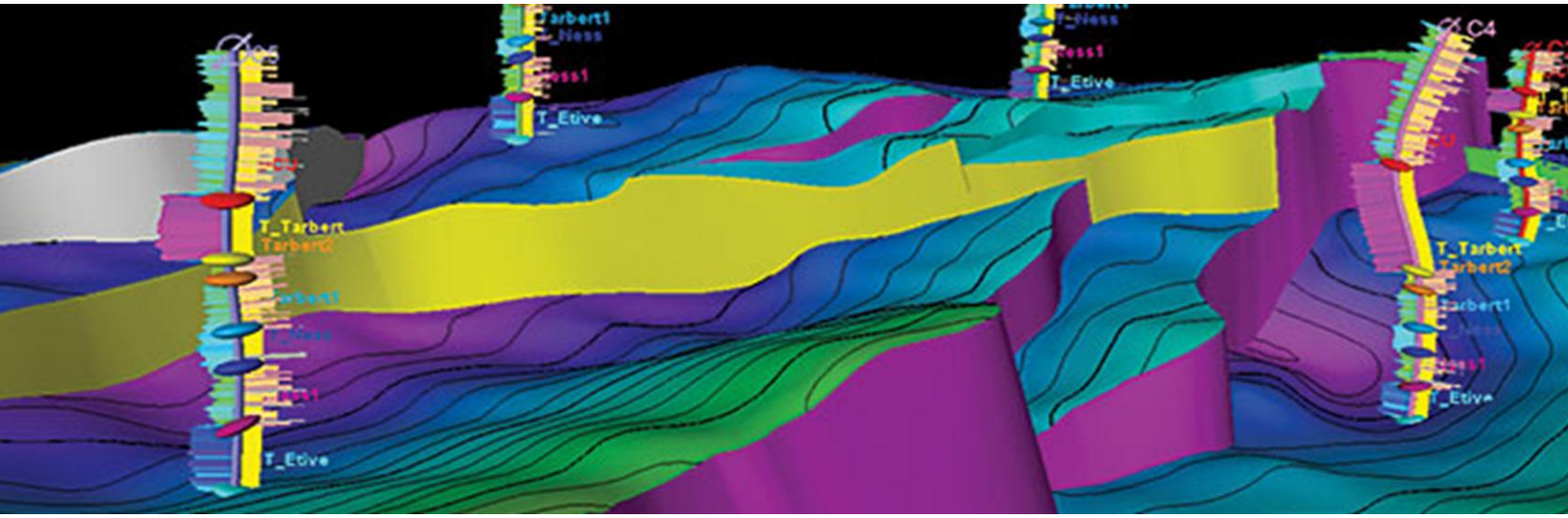
Uniting the Business and Petrotechnical Worlds

Addressing the challenges of E&P through a unified, familiar, and open petrotechnical computing environment that promotes collaboration, accelerates integrated innovation, and improves productivity and decision making



Abstract

Schlumberger and Microsoft have been working together for nearly a decade to address the challenges of oil and gas exploration and production (E&P). Through a variety of engagements—including technology adoption previews, architectural design sessions, technical and executive briefings, and performance tuning and optimization analyses—Microsoft and Schlumberger are helping drive the E&P industry towards a vision of integrated operations, in which full asset awareness is realized.

The synergy of this partnership has resulted in solutions that help our oil and gas customers meet ever-increasing challenges and realize new value. Schlumberger has taken advantage of a range of Microsoft state-of-the-art technologies to enhance the capabilities of its domain solutions, beginning with its flagship product, the Petrel* E&P software platform; Petrel was the first major oil and gas software to be developed on Microsoft .NET.

The release in 2011 of the Schlumberger Studio* E&P knowledge environment maximizes Schlumberger's investment in Microsoft technology, and delivers a solution that makes it easier for petrotechnical professionals to collaborate, learn, gain insights, understand, decide, and act. The solution captures this knowledge in context, helping organizations reduce the need for rework and streamlining processes to make their teams as productive as possible. The latest achievement of the Schlumberger/Microsoft partnership is the availability of the Studio database on Microsoft SQL Server 2012.

* = Mark of Schlumberger

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Today's challenges for the oil and gas industry

The oil and gas exploration and production industry faces many significant challenges. Global economic and geopolitical forces have created a volatile, rapidly fluctuating crude oil and gas market. Global demand for energy continues to increase dramatically, and competition for depleting resources is driving the need to reduce operating costs while increasing recovery rates and reserves. At the same time, the pool of skilled and well-trained technical resources has declined. In addition, shareholders continually pressure companies for a return on their investments. And while advanced technologies can now provide vast amounts of near real-time data, that data volume and complexity makes it difficult for asset teams to efficiently analyze and understand, hindering their ability to reduce uncertainty and risk and improve decision making.

To help address these challenges, Microsoft and Schlumberger have joined forces, working together to combine Schlumberger's expertise in oil and gas with Microsoft business technology.

Microsoft in oil and gas

Microsoft is dedicated to working with all major industries, helping them use Microsoft technology to solve their unique industry challenges. For a decade, Microsoft has had a dedicated oil and gas team, beginning in the United States and evolving into a truly global effort with team activity in more than 70 countries. Microsoft team members have a wealth of oil and gas industry experience along the entire value chain.

The foundation of the Microsoft strategy is to partner with leading oil and gas industry technology and solution providers whose applications equip workers to solve complex domain and operational challenges—collaborating in product development, sales, and services, to provide oil and gas companies with integrated solutions that give business and technical people the right tools and real-time data to optimize collaborative analysis, business insight, innovation, productivity, and decision making.

Since 2005, Schlumberger has been one of the Microsoft oil and gas team's key industry partners.

Oilfield services leader Schlumberger

As the world's largest oilfield services company, Schlumberger provides customers with a range of software solutions that aid in the discovery, development, and production of natural resources. Schlumberger supplies products and services that span formation evaluation through directional drilling, well cementing and stimulation, well completions, and production. Schlumberger also provides consulting, software, information management, and IT infrastructure services that support core industry operational processes.

Schlumberger's flagship product, the Petrel* E&P software platform, supports the rapid development and updating of three-dimensional subsurface models, with workflows spanning seismic interpretation through reservoir simulation. Petrel helps increase reservoir performance by improving asset team productivity. Additionally, Schlumberger solutions include the Techlog* wellbore software platform and the Avocet* production operations software platform.

Petrel is now integrated with Studio, which improves productivity with multiuser database access and collaborative work sessions with experts across the enterprise. Based on several key Microsoft technologies, Studio lets geoscientists and engineers capture more than just data—they can share and store how a result was accomplished, complete with data history and quality tags. The rigor of the database, coupled with the intuitive data awareness enabled by Studio, gives users a far more productive multiuser working experience.

Ultimately, the three key domain platforms will themselves be integrated through Studio (Figure 1).

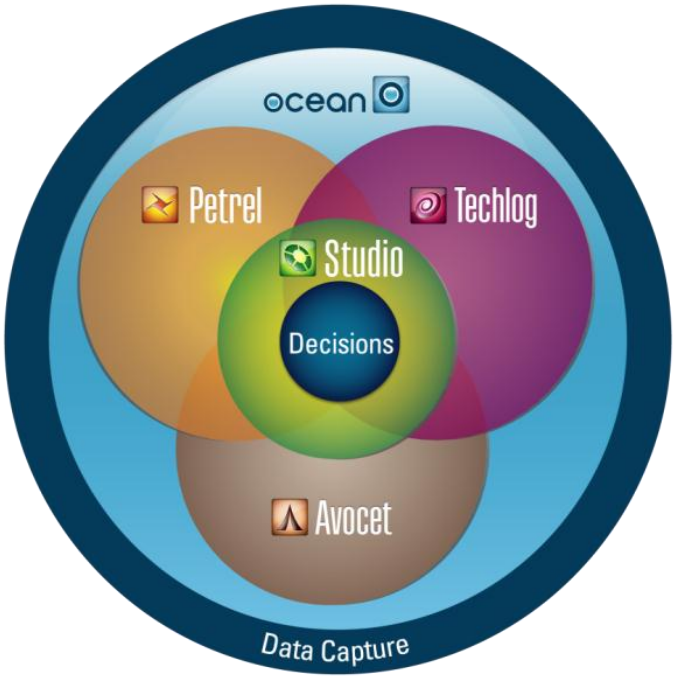

Figure 1. Schlumberger vision for an integrated E&P platform.

Microsoft and Schlumberger: innovation from industry leaders

For nearly a decade, Schlumberger and Microsoft have worked together to better align oil and gas analysis and enterprise desktop software capabilities and to accelerate the delivery of exploration and production desktop solutions on the Windows operating system and Microsoft .NET. The companies are working towards a shared vision of operations that work together, where full asset awareness is realized. A single IT environment helps reduce cost and complexity by making it possible for customers to integrate the petrotechnical desktop with the enterprise desktop.

"Schlumberger is a leader in delivering advanced solutions to the oil and gas industry," said Steve Ballmer, chief executive officer at Microsoft. "We're collaborating on the next generation of its software that is being designed to give better and more predictive information to geoscientists and engineers. Combining our talents in this extremely important work will have a tremendous impact on the industry."[1]

[1] https://www.microsoft.com/en-us/news/press/2005/may05/05-25SchlumbergerInitiativePR.aspx

"The oil and gas industry faces critical challenges to meet growing global demand, replace reserves, increase recovery rates and manage the shortage of skilled professionals. Every company will need to harness innovative technologies to succeed," said Tony Bowman, president of Schlumberger Information Solutions (SIS). "We are excited to work closely with Microsoft to deliver innovation that bridges the technical and business-decision processes to better meet these challenges."

Synergistic success: achievement highlights

To date, the Microsoft/Schlumberger partnership has resulted in some real game changers for petrotechnical professionals who use Schlumberger solutions.

- **Petrel and the Ocean Software Development Framework on .NET.**
  The initial achievement of the partnership was the development and re-engineering of Schlumberger's flagship product Petrel on Microsoft .NET—the first major oil and gas software application to do so. Schlumberger also developed its Ocean* software development framework, the most productive software development environment available in the oil and gas industry, on .NET.

  Ocean accelerates the development and deployment of innovative software solutions to solve particular industry challenges, making it possible for Schlumberger—and Petrel users—to quickly and easily add new functionality to Petrel. What once took months or weeks to develop can now take only days or hours. Companies can create their own specialized workflows to solve or seamlessly incorporate their own specialized tools and intellectual property by deploying software plug-ins to the comprehensive range of existing Petrel software tools.

- **Interoperation with Microsoft Lync**.
  The integration of Microsoft Lync communications technology into Petrel (initially, but now as part of Studio) was an innovative breakthrough that makes it possible for users to see the online status of other users who work on the project data, observe their online status/availability, and, with a simple click, initiate a chat with that person right from the Petrel window. With both parties sharing a common data context, questions and issues are easier to resolve. Looking at the same model at the same time and being able to talk (or chat) in real time is a much more efficient way to work.

- **Taking advantage of the full spectrum of Microsoft technologies**.
  Studio catapults Petrel to a robust multi-domain, multi-user environment that is scalable across an E&P enterprise—while maintaining the Petrel look, feel, and flexibility that users love to work in. Going forward, Studio will be the enabling foundation for cross-domain integration of Schlumberger's three key platforms: Petrel, Techlog, and Avocet.

Studio and the Schlumberger domain platforms use a range of Microsoft technologies (Figure 2)**.**

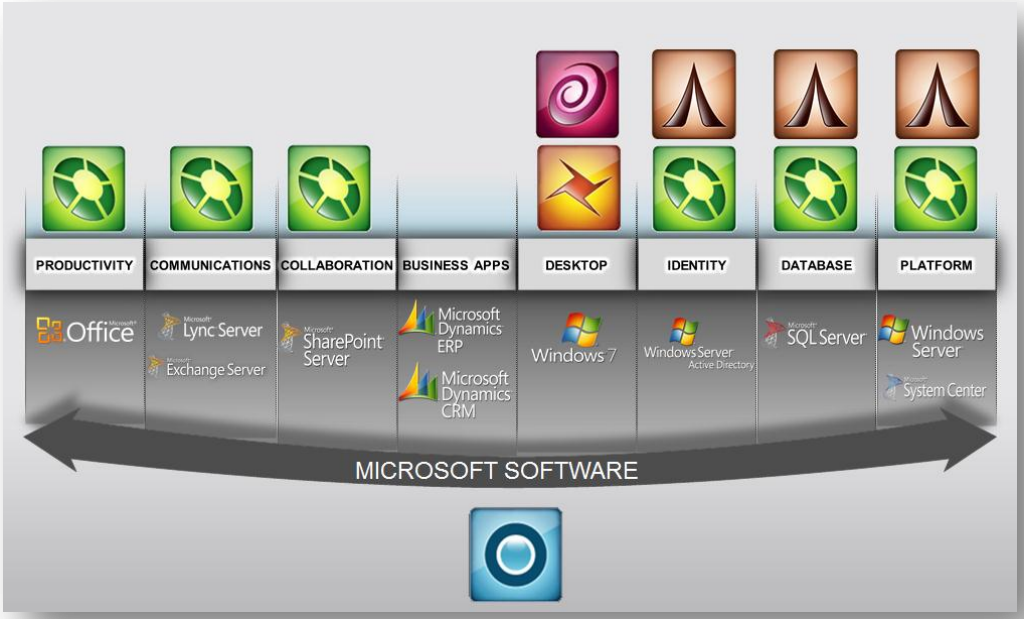

Figure 2. Schlumberger platform solutions leverage the full spectrum of Microsoft state-of-the-art technologies.

The seamless interoperation of Microsoft technologies and their familiar, easy-to-use interfaces with the petrotechnical desktop (Figure 3) means a reduced learning curve for E&P professionals and knowledge workers—especially helpful for newer workers to the industry.

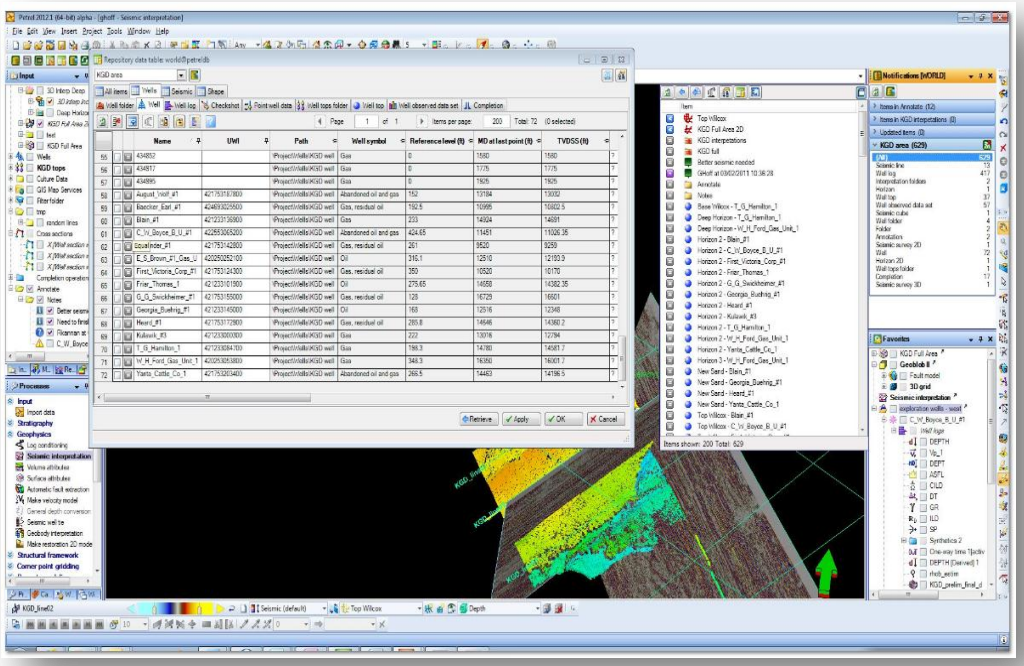

Figure 3. Seamless integration of familiar, easy-to-use Microsoft technology with the petrotechnical desktop reduces the learning curve for E&P workers.

Additionally, Microsoft Lync Server and Microsoft SharePoint Server enable the communication and collaboration capabilities in Studio that make it possible for asset team members to collaborate in the context of their Petrel project and data (Figure 4).

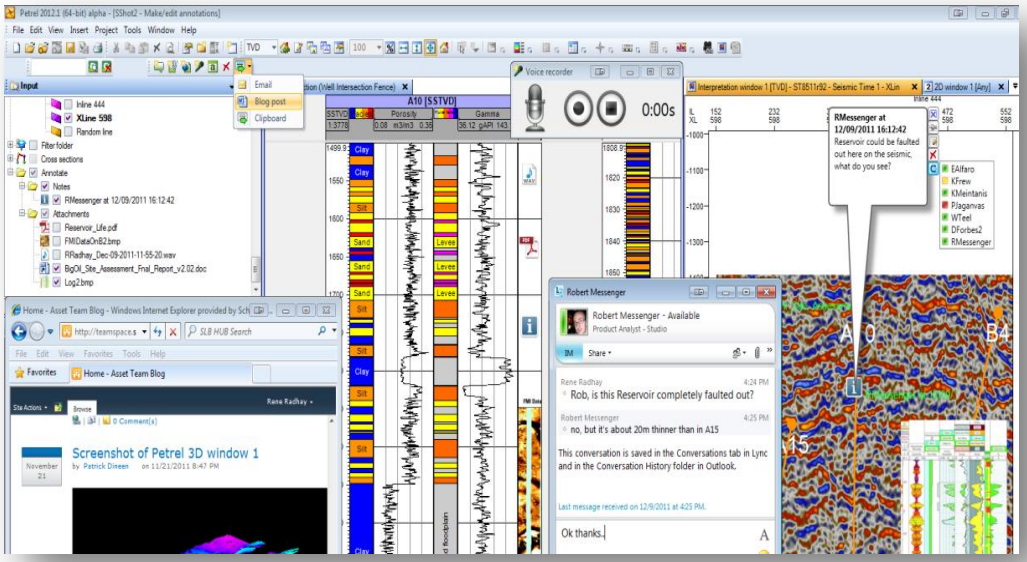

Figure 4. Studio powered by Microsoft Lync Server and Microsoft SharePoint Server make it possible for petrotechnical professionals to collaborate in the context of their Petrel projects and data.

Studio also works with Bing Maps, allowing the integration of project data— such as blocks, licenses, fields, seismic data and wells—to be easily displayed on a map (Figure 5).

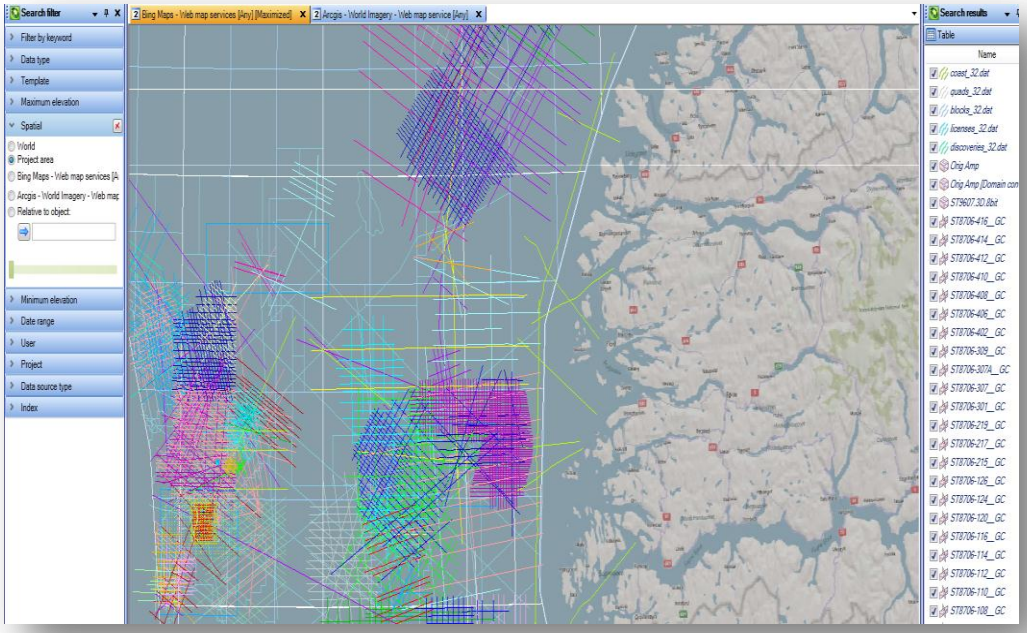

Figure 5. Map-based data integration with Bing Maps allows asset team members to easily view project data.

Studio improves productivity with multiuser database access and collaborative work sessions with experts across the enterprise. In Studio , petrotechnical professionals and operations personnel across all E&P disciplines can capture more than just data—they can share and store how a result was accomplished, complete with data history and quality tags.

Users can also add technical papers, diagrams, analogs, movies, and voice notes to their projects, putting their knowledge to work today, tomorrow, and in the future. In Studio, users don't merely search for data; they actually *find* data and information from any of their different data stores. These data stores can include local Petrel projects and stores or the Studio database. Data sources can also include any other resource users might have access to, such as Bing Map with field information, legacy applications, detailed wellbore information from petrophysicists in Techlog, well information in the IHS database, or any other petrotechnical sources through OpenSpirit.

Studio now provides the database for Petrel, and will be the database for Techlog and Avocet in the future. The rigor of the database, coupled with the intuitive data awareness enabled by Studio, gives users a far more productive multiuser working experience.

Studio database on SQL Server 2012

The newest version of the Studio database can use SQL Server 2012, bringing the many cost, performance, and scalability advantages of Microsoft database software to Schlumberger customers (available December 2012).

SQL Server 2012 comes with major database-related features built in: high availability, remote disaster recovery, partitioning, data compression, transparent data encryption, spatial, master data management, complex event processing, ETL, OLAP, data mining, reporting services, self-service business intelligence (BI) tools, and many more. With SQL Server, these capabilities are *included*—no additional features or products need to be purchased.

SQL Server 2012 provides Studio with a comprehensive, integrated, reliable, and enterprise-ready data-management software solution that can support the largest and most process-intensive deployments, while also providing benefits for smaller deployments:

- Empowers workers with integrated, collaborative tools that bring together heterogeneous data from across the business.
- Improves organizational effectiveness by enabling users to quickly get the information they need, and stay in alignment with organizational objectives.
- Enables IT efficiency by delivering enterprise-class scalability and performance plus a familiar, intuitive toolset for developers and administrators.
- Provides blazing-fast performance backed by industry-leading benchmarks. SQL Server continuously leads in industry-relevant TPC-E and TPC-H performance benchmarks;[2] release after release, SQL Server is SAP-certified to run some of the industry's most demanding workloads.

[2] http://www.microsoft.com/sqlserver/en/us/product-info/benchmarks.aspx

Schlumberger and Microsoft have worked together closely to bring the advantages of SQL Server to the Studio database. For the IT staff, the SQL Server-backed version of the solution is fast to deploy and easy to administer. In addition, it provides a significantly lower cost of ownership and fully integrated security and spatial data environments based on Active Directory Domain Services and SQL Server 2012 spatial data management capabilities.

Benchmark testing confirms performance and scalability

TCO and ease of deployment are important metrics; however, it is even more important to ensure that petrotechnical users can do their work as effectively and efficiently as possible. For this reason, Microsoft and Schlumberger worked to optimize and test the performance and scalability of Petrel with Studio on SQL Server 2012, using real-world data sets that encompass the breadth of data that petrotechnical users work with on a daily basis.

Benchmarking tests to evaluate the ease of deployment, performance, and scalability were run at both the Microsoft Platform Adoption Center (PAC) in Redmond, Washington and by the SIS Commercialization team at the Houston Technology Center. Microsoft and Schlumberger ran tests against a typical server configuration, and then scaled to use more powerful server hardware configurations.

The performance benchmarking tests covered a broad range of E&P data types based on several existing Petrel shallow-water offshore development projects. The tests used broad ranges of data volumes—from 2,000 to 10,000 wells, up to 48,000 continuous and 12,000 discrete well logs, 6,000 to 10,000 check shot surveys, and up to 40 seismic cubes with 1,600 seismic lines—and included both low and high cardinality of data to best represent real-world scenarios.

The testing focused heavily on spatial and large bulk data, both of which are critical to efficiently reading and writing E&P data. In addition, to measure and optimize the performance at each stage of the transfer workflows, both empty and fully populated repositories were tested.

This effort successfully demonstrated that Petrel with the Studio database and SQL Server 2012 speeds deployment while continuing to offer the performance and scalability end users expect for their E&P workflows.

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The Schlumberger and Microsoft partnership has resulted in many innovative joint solutions—including the availability of the Studio database on SQL Server 2012—that help oil and gas customers meet the ever-increasing industry challenges and promote collaboration, accelerate innovation, amplify insight, and minimize risk. Together, Schlumberger and Microsoft are helping our customers realize new value through a unified, familiar, and open petrotechnical computing environment.

About Schlumberger

Schlumberger is the leading oilfield services provider, trusted to deliver superior results and improved E&P performance for oil and gas companies around the world. Through our well site operations and in our research and engineering facilities, we are working to develop products, services and solutions that optimize customer performance in a safe and environmentally sound manner.

For more information about Schlumberger products and services,
visit: **www.slb.com/**

About Microsoft

Founded in 1975, Microsoft (Nasdaq “MSFT”) is the worldwide leader in software, services, and solutions that help people and businesses realize their full potential.

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