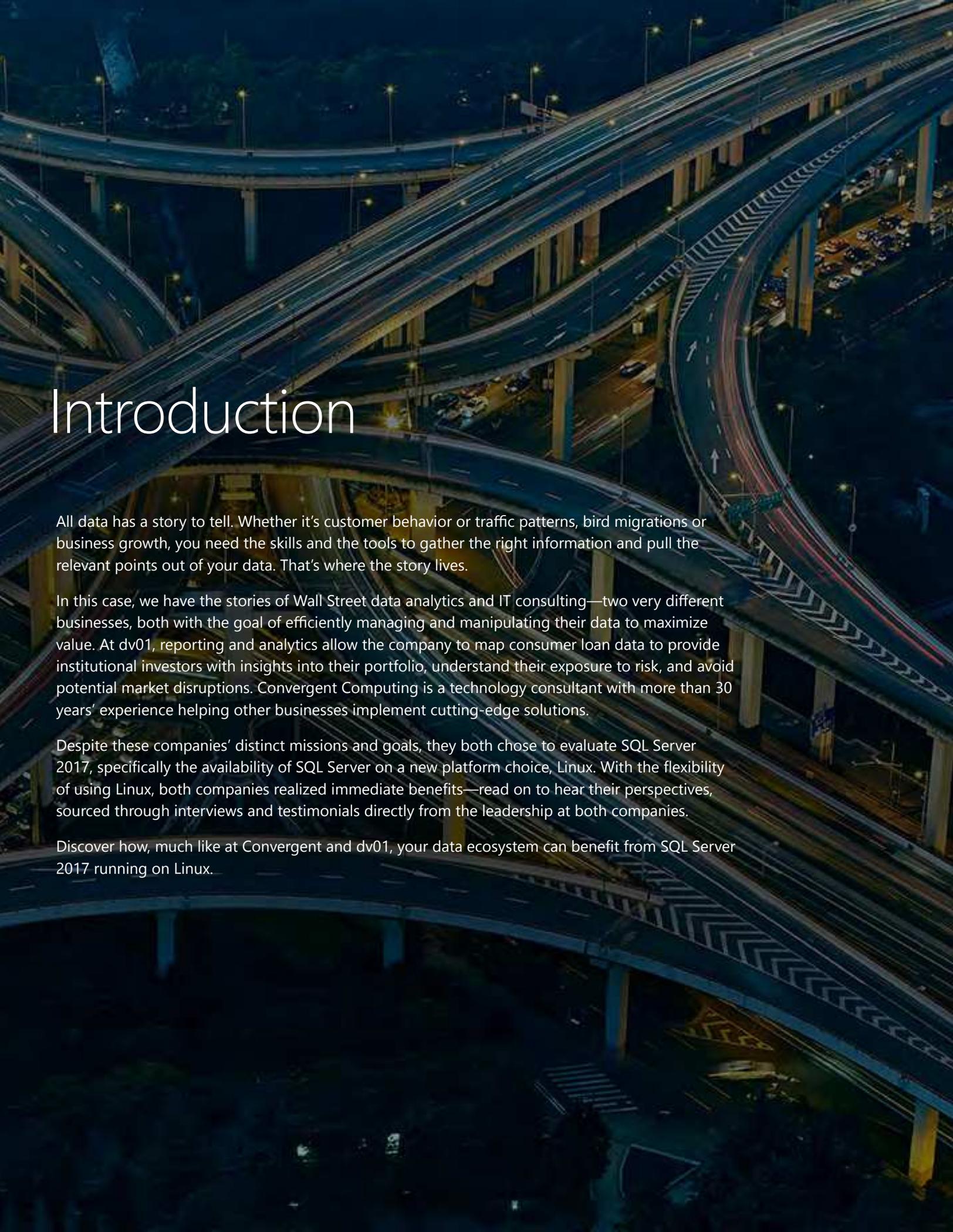


A nighttime cityscape featuring a prominent bridge over a river. The bridge has a unique, angular design. In the background, several skyscrapers are lit up, including one with a distinctive pyramidal top. A blue, semi-transparent data visualization overlay is present, consisting of a network of lines and nodes, with some nodes marked with small blue plus signs. The overall scene is dark, with the city lights providing the primary illumination.

SQL Server 2017 on Linux: Top Six Reasons Companies Make the Move

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Introduction

All data has a story to tell. Whether it's customer behavior or traffic patterns, bird migrations or business growth, you need the skills and the tools to gather the right information and pull the relevant points out of your data. That's where the story lives.

In this case, we have the stories of Wall Street data analytics and IT consulting—two very different businesses, both with the goal of efficiently managing and manipulating their data to maximize value. At dv01, reporting and analytics allow the company to map consumer loan data to provide institutional investors with insights into their portfolio, understand their exposure to risk, and avoid potential market disruptions. Convergent Computing is a technology consultant with more than 30 years' experience helping other businesses implement cutting-edge solutions.

Despite these companies' distinct missions and goals, they both chose to evaluate SQL Server 2017, specifically the availability of SQL Server on a new platform choice, Linux. With the flexibility of using Linux, both companies realized immediate benefits—read on to hear their perspectives, sourced through interviews and testimonials directly from the leadership at both companies.

Discover how, much like at Convergent and dv01, your data ecosystem can benefit from SQL Server 2017 running on Linux.

Flexibility

In every story, there's an element of choice: A or B, true or false, to be or not to be. Data is the same. Do you want your data on a public cloud, a private cloud, or on premises? Which language should you use to write your applications? What platform do you want to run those apps on?

SQL Server 2017 saves you from those difficult choices—and options that could constrain your productivity. Use the language of your choice, on the platform of your choice, on premises or in the cloud.

Any language, any platform, any cloud

As a company evolves, a particular technology stack can become baked into their DNA. In the case of dv01, VP of Engineering Dean Chen says, "Our engineers came from an open source background and we're an open source shop." This made trying SQL Server 2017 on Linux for many of the company's critical workloads a natural choice. Once dv01 leadership saw that the updated SQL Server platform outperformed previous solutions and competitive platforms, the decision to adopt was easy.

Because SQL Server 2017 runs on Windows, Linux, Docker containers, and more, you can deploy on the platform—or combination of platforms—that makes the most sense for your business. And whether your engineers are more comfortable with C#, Java, Ruby, or another coding language, they can build apps using the best language and platform for the job, and then host the apps on any cloud provider or on premises server that suits their needs.

Interoperability you can rely on

Perhaps, like many companies, you take advantage of multiple platforms. Fortunately, SQL Server 2017 supports that, too. Your data and applications can easily migrate across platforms.

This also means your data can migrate from one platform to another with minimal downtime using distributed availability groups spanned across both Windows and Linux environments. If you have issues with one deployment, you can use Always On availability groups to perform migrations across Windows and Linux, or fail over between platforms to avoid downtime.



We didn't have to export data from one database platform to another that required the data to be certified; we actually had the database certified.

Rand Morimoto

President, Convergent Computing

Performance

When working with data, the technology you're using should help you with the task—not get in the way. That's why any loss of query performance can be a huge headache. The ability of your analysts and engineers to query data quickly can give your business the competitive edge.

As Dean Chen from dv01 tells it, "We have a few queries that are really expensive ... and because these queries are typically longer-running in nature, any speed improvement makes a huge, huge difference." That's one big reason dv01 decided to go with SQL Server 2017 on Linux.

Quicker queries mean time and money saved

Included with SQL Server 2017 (and available with Linux-based deployments) are high-performance features such as columnstore, which provides column-based data storage and processing to achieve up to 10 times the query performance and data compression over row-based storage, and in-memory OLTP, which brings transaction processing to memory-optimized tables that can be up to 30 times faster than the speed of disk-based tables. With in-memory columnstore, queries can execute up to 100 times faster than disk. All of which increases the speed of your data-driven applications.

Analytics and transaction processing, simultaneously

Analytics data is typically stored in a data warehouse or data mart that is dedicated to running analytics queries. However, that can introduce several challenges, including

complexity, cost, and data latency. With real-time operational analytics, you can eliminate the need for ETL (Extract, Transform, Load) and a data warehouse.

Real-time analytics uses an updateable columnstore index on a rowstore table. The columnstore index maintains a copy of the data, so the OLTP and analytics workloads run against separate copies of the data. This minimizes the performance impact of both workloads running at the same time.

"It's a pretty special use case, being able to do these analytics queries in real-time," says Dean Chen from dv01. "That's typically reserved for the realm of Hadoop or big data infrastructures that have a lot higher latency. Microsoft was really helpful as part of that process, and it's one of those things that fit our use case really well."

Efficiency at its best

Lastly, Adaptive Query Processing is available to further improve query performance. Adaptive Query Processing not only designs the query execution plan and then executes it in the most efficient way, but it also optimizes the plan while the actual query is running, or even after the query execution is completed to benefit later executions.

Query processing is also getting smarter all the time. Improvements to Adaptive Query Processing in SQL Server 2017 include batch mode memory grant feedback, batch mode adaptive joins, and interleaved execution.

Security

Few things are more important to data than how secure it is. If your business relies heavily on data, and that data is vulnerable, it puts the entire enterprise at risk—potentially including your customers, partners, and employees. Establishing your business on the foundation of quality, reliable data means trusting that it can't be tampered with, wherever it lives.

As the security landscape has changed over the years, Microsoft has continued to change with it. With engineered security from the ground up and layers of protection philosophy, SQL Server stands out with the fewest vulnerabilities of any enterprise database in the National Institute of Standards and Technology (NIST) database over the last seven years.

How do you protect data when it is in transit? How do you provide the right access to the right people at the right time? These are the challenges that SQL Server has consistently set out to solve.



With SQL Server, security is just so well integrated—it's literally something you turn on, and data is encrypted on disk.

Dean Chen

VP of Engineering, dv01

Secure at rest and in motion

Large amounts of data leads to plenty of complexity. Data is queried, transmitted, backed up, and replicated nearly constantly. With all that activity, any link in the chain could be a potential vulnerability.

That's why Always Encrypted is critical, protecting your sensitive data stored in SQL Server databases. Always Encrypted enables encryption of sensitive data inside applications and on the wire, while never revealing the encryption keys to the database engine. As a result, Always Encrypted provides a separation between those who own the data and those who manage the data. And Row-Level Security adds another layer of access control by restricting permissions to rows in a database table based on characteristics of the user executing a query.

Protection that's centrally managed

To make security features even easier to manage in SQL Server, you can use Active Directory authentication to centralize the identities of database users and other services in one location. This way, you can simplify permission management and avoid storing passwords.



¹National Institute of Standards and Technology Comprehensive Vulnerability Database as of January 17, 2017.

Cost

Beyond the complex tasks of building and maintaining databases, you're also concerned about the shifting costs of data. If queries take more time than they need to, that increases the hours spent troubleshooting by your developers and administrators. And as your data needs scale up, the more expensive storing all that information becomes. Fortunately, SQL on Linux offers a potentially wallet-saving solution, where everything is built in from the start.



"That's where Linux has played in some of our other models," says Rand Morimoto of Convergent Computing. "I can basically do a lot of our work on lower-cost hardware." He's also quick to emphasize that the benefit is more than just financial, but also performance-based: "It's about what can I put on Linux that will decrease my marginal cost and provide me with same or equivalent performance if not potentially better performance."

Don't pay for more than you have to

From additional hardware and software licenses to training and sheer man hours, deploying and maintaining databases can get expensive quickly. But SQL Server offers ways to reduce those costs, or possibly avoid them

altogether, as happened in the case of Convergent. "Using SQL Server Management Studio to manage both Linux and Windows environments ... means we don't have to retrain people or certify people on a new platform," says Rich Dorfman, VP of Professional Services at Convergent.

Get your investment back faster

Of course, your databases and the data that's within them are priceless. But that doesn't mean that you should be required to break the bank to work with your data. With SQL Server 2017 on Linux, it's possible to realize a lower total cost of ownership (TCO) and quicker return on investment (ROI) than if you choose a competing vendor. Avoiding extra licenses, training time, and hardware costs will ensure your initial investment in SQL Server pays off.



Our normal return on investment for any of the hardware has typically been about two-and-a-half years. With this current model, we're able to get a return on investment in less than eight-and-a-half months.

Rand Morimoto

President, Convergent Computing

Simplicity

The explosion of data over the last few decades has created a dramatic shift in how we store, analyze, manipulate, and secure information. Databases and datasets can be infinitely complex, but working with that data shouldn't be so difficult. That's why SQL Server aims to simplify data management for you and for your engineers.

Ease of migration saves time and money

Although Windows and Linux are, at first glance, somewhat different operating systems, the experience of migrating data from one platform to the other isn't as complicated of a process as it might seem. "Moving SQL Server from Windows to Linux was actually one of the easiest migration experiences that we've had," says Chris Amaris, Convergent's Chief Technology Officer and Project Technical Lead. "We took the SQL Server Windows database offline, encrypted it, and moved it across to the new Linux environment with certain keys. When we brought the database up in the new environment, we certified that the keys matched, to confirm the data had not been tampered with."

Rand Morimoto, President at Convergent, confirms, "Because we were moving the SQL Server database from one operating system to another, rather than porting data from one database platform to another, we didn't have to have the data completely recertified," he says. "We only had to show the database transferred unmodified, which saved us from a very lengthy and costly compliance audit, review, and recertification."

Because the migration process is made simpler, there isn't the need for advanced customizations or third-party solutions, enabling engineers to refocus their work on higher-value tasks.



When it comes to just migrating our infrastructure over, it was literally plug and play, and that's how it ended up working out.

Dean Chen

VP of Engineering, dv01

Everything Built In

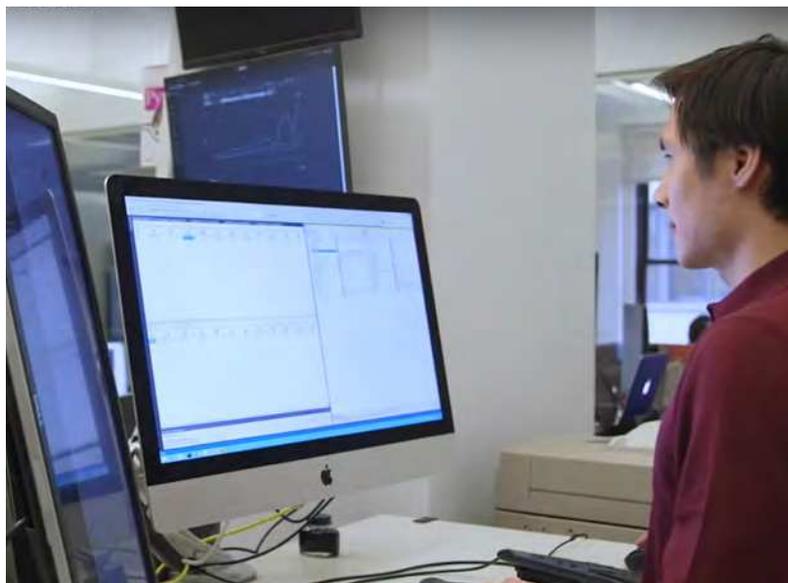
With database management systems, it's no small undertaking to meet the mission-critical needs of modern enterprises. Features that used to be optional are now frequently required by organizations to meet new standards of security, functionality, and usability. Achieving mission-critical readiness by adding options and feature packs can drive up costs quickly. That's why SQL Server 2017 on Linux builds in everything you need from the get-go.

An unmatched TCO with all the features you need

By including everything you need to manage your data and keep it secure, SQL Server is able to keep your management costs down. Because everything works "out of the box" when you get started, you save engineering hours setting up a custom solution.

A key factor in reducing your Total Cost of Ownership (TCO) is the inclusion of enterprise-level features with SQL Server, which for comparable database platforms are either available at an additional cost or simply not available, necessitating a third-party solution. With features like data compression, columnstore, partitioning, high availability, and disaster recovery included, your organization can provide robust data-driven applications to customers for a fraction of the cost of the competition.

As Scott Guthrie, Executive Vice President, Cloud and Enterprise Group at Microsoft, stated in his recent announcement, "SQL Server on Linux will provide customers with even more flexibility in their data solution, one with mission-critical performance, industry-leading TCO, best-in-class security, and hybrid cloud innovations—all built in."



With SQL Server, things just came 'out-of-the-box'—it worked, it was super polished. We didn't waste much time trading stuff out.

Dean Chen

VP of Engineering, dv01



Summary

The data landscape is always changing, so it can be a challenge to keep up, and to do so in a way that makes the most sense for your business. The right database platform can be a future-proof foundation on which you can build the applications and tools your business needs to derive insights from your data—all while keeping costs under control. Is your data ecosystem ready for tomorrow?

[Get started with SQL Server 2017 on Linux today >](#)