The process of refining data into intelligence is one of the most vital and strategic in which your organization is involved. Data is everywhere but actual intelligence is all too scarce. Without the proper infrastructure, technology, and applications to organize and analyze data, your business may be losing insights at an alarming rate. However, with the right solutions in place, you will be well positioned to manage your data effectively and deliver actionable insights that deliver real value to the bottom line.

Dell EMC and Intel® offer you best-in-class options designed to meet you where you are in your data management and analytics efforts. Armed with cutting-edge servers and the latest in persistent memory, you'll be far ahead of competitors struggling with aging technology. Refine your data into information that drives valuable business insights.
Every day, humans and devices produce 2.5 quintillion bytes of data. It’s no exaggeration to state that organizations are drowning in data. The scariest part? According to Forrester, 42% of organizations’ data goes unused. How do you start using the data you collect that is just sitting there?

Embracing the latest server technology and data-crunching applications is a major first step. A recent ESG survey found that, on average, organizations with modernized IT infrastructures reported 32% more of their organization’s data is usable within their analytics environment compared to organizations with aging IT. These same modernized organizations reported that their analytics environments were nearly 7x more likely to be very effective at driving business value. Businesses with the most up-to-date servers are leading the competition in multiple functional categories and realizing very real competitive advantages.

IT plays a key role in positioning their organizations for maximum success. Organizations do this by investing wisely in the best technology for their data management and analytics goals. At the same time, they must learn how to partner effectively with leading applications such as SAP HANA and Microsoft SQL Server to transform their chaotic raw data efficiently into organized, more actionable insights.

Regardless of your industry, usable intelligence will always be in demand. This eBook explores the benefits of modern servers as well as adjacent technology and applications for managing data in a way that you can apply to your organization with value-driving results. The goal? To position you as a leader in your field by optimizing your analytics environment.

Competitive leaders are 3x as likely to report leading the market in key areas of business compared to industry laggards. And leaders demonstrate benefits you can monetize right now rather than only in the future, showing just how pivotal an effective analytics environment running on optimized infrastructure can be. The majority of leading organizations are experiencing the following as benefits of their analytics environment right now:

Uncovering new market opportunities
Increasing insights into historical results
Increasing insights into new products and services
Improved forecast accuracy
Increasing customer spend
Minimizing cost of maintaining compliance

The majority of laggards report that they hope to capture these benefits in the future. Do you really want to wait?
The Applications Working to Refine Data into Intelligence

“Imagine,” SAP suggests, “you are about to post a transaction and have reporting and predictive functions that can help you simulate the impact of your decision, providing options and helping you make a better decision.”

Sounds intriguing, right? Databases like SAP HANA and Microsoft SQL Server offer just such an opportunity to combine traditional structured business and operations data, and unstructured, machine and IoT data with powerful analytic capabilities. These platforms enable your business to process data in near real time and make actionable decisions based upon this information.

While relational database management systems (RDBMS) have been around for a while, they have evolved with new architectures and capabilities critical for powering intelligent applications, business process and analytics. At the simplest level of explanation, they help businesses track relationships by assigning unique numbers to those relationships and tracking related activity to identify patterns. Picture your retail store loyalty card: it’s perhaps tied to your phone number, and with it the store tracks your buying patterns and even your path through the retail location. These days, that information can be transformed strategically into next steps such as targeted coupons and advertising, as well as even more in-depth insights to further the business.

SAP HANA and Microsoft SQL Server are two top-tier options for organizing and analyzing your data to make it work for you.

SAP HANA

Sample use cases:

» Create demand models to predict use and support financial decisions
» Support service by delivering real-time notifications
» Differentiate customer service by delivering real-time risk analysis
» Support sales teams with up-to-the-minute data on customer trends

Business benefits:

» “$34.1M higher revenue per year for an organization”
» “21% higher gross user productivity for affected applications”
» “53% less unplanned downtime”

Microsoft SQL Server

Sample use cases:

» Combine with Hadoop to provide value and insight from data lakes
» Build rich, interactive reports to share with executives as well as the field
» Consolidate data from different sources and perform analytics with incorporated artificial intelligence and machine learning

Business benefits:

» Secure data: SQL Server was found to be the most secure RDBMS over the last 7 years
» Cost-effective: Offered at a fraction of the cost compared to competitors like Oracle
» Most consistent data platform
» Speed: Offers advanced analytics at up to 1M predictions/second
The Server Technology That Ensures SAP HANA and Microsoft SQL Server Deliver Value

Cutting-edge apps are incredibly popular, but they can’t do their job effectively without the proper server technology to support them. Vast quantities of data require rich memory and storage options. To understand this landscape, it helps to think of storage and memory as a continuum.

Storage-Class Memory
Blurring the Line Between Memory and Storage
Faster than SSD. Slower than DRAM.

On the slow end is T2 storage. Hard disk drives (HDDs) are the slowest method for a server to access stored data. These are usually broken up into two categories: (T2) slow spinning, but very large capacity; and (T1) faster spinning, but smaller capacity. Next come solid state drives (SSDs), which sit on SATA and SAS buses, but can access data 10x faster than the fastest spinning drives (T1). After that, moving further toward speed and away from capacity is NVMe, which sits on the PCIe bus and is 10x to 100x faster than SSDs and up to 1000x faster than T1 drives. Like SSDs and HDDs, and unlike DRAM memory, the data on NVMe drives isn’t erased when power is lost. At the far end of the spectrum is DRAM, which is pure memory.

Thinking about SAP HANA and Microsoft SQL Server, you’ve probably come to the realization that what you need is really the speed of memory and economical storage. That’s where persistent memory comes in. Modern servers come equipped with this, the latest innovation in memory technology. Specifically, Intel® Optane™ DC Persistent Memory provides you with large, affordable memory. At the same time, you’re getting the high-performance storage you need when it comes to latency, bandwidth, and endurance. Best of all, persistent memory is, as the name implies, persistent. If your server goes down, your data is retained until you get it back up and running again.

Intel® Optane™ DC Persistent Memory is currently available in three capacities: 128, 256, and 512 GB. Compare this with regular memory, which only allows you to choose between 8, 16, 32, 64, or 128 GB options. This larger capacity is particularly relevant when running SAP HANA, but persistent memory benefits extend to SQL Server as well. For SQL Server 2019, the larger capacity plays a facilitating role but so too does the technology’s performance gain benefit: With Intel® Optane™ DC Persistent Memory you can perform transactions directly on the memory bus, removing protocol and storage layers. Optane memory has advantages over other persistent memory options like NVMe. For example, SQL Server 2019 in Application Direct Mode was able to process 2.7x the number of transactions if you compare Intel® Optane™ DC Persistent Memory with NVMe drives.9

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1. L1 Cache: 1 ns
2. L2 Cache: 1 ns
3. DRAM: 100 ns
4. NVM: 1 ~ 10 μs
5. NVMe drives and NVDIMMs fill the gap
6. T0 SSD: 100 μs
7. T1 Storage: 1 ms
8. T2 Storage: 10 ms
9. Application Direct Mode
   - Persistent
   - High availability/less downtime
   - Significantly faster storage
10. Memory Mode
    - High capacity
    - Affordable
    - Ease of adoption
Servers with Persistent Memory Support Data Management and Analytics Workloads

Dell EMC is ready to partner with you to find the right fit of server technology, and you’ll be in great company: Frost & Sullivan recently found that 37% of businesses report that their preferred server for running SAP HANA is Dell EMC, twice as many as prefer the next brand. Here are three options designed to meet you where you are in your data management and analytics journey.

### Good: PowerEdge MX

The MX is your starting point for data management and analytics workloads. Already validated and tested, the MX has SAP HANA certification. Equipped with Intel® Optane™ DC Persistent Memory, it also offers at least one additional advantage for organizations running data workloads: You can dynamically add storage with no downtime on the compute node thanks to the MX’s storage sleds. This benefit is particularly useful for those who don’t utilize SAN-based storage for their databases. In recent testing, the MX processed more orders of a SQL database per minute than major competitors. Important when dealing with sensitive data, all PowerEdge servers offer a cyber-resilient architecture with layers of security.

**Award**

“...The purposeful design makes PowerEdge MX ready to support fully disaggregated components, down to memory-centric devices such as storage class memory, GPUs, and FPGAs, to offer full composability...”

### Combine Servers and Storage to Turbocharge Your SAP environment

**PowerEdge MX + PowerMax Storage**

The MX is particularly effective at handling data workloads when partnered with Dell EMC PowerMax storage. PowerMax improves time to market with end-to-end automation of time-consuming tasks for SAP System Copy/Refresh, thanks to the advanced snapshots capabilities of its SnapVX software and SAP Landscape Management integration. PowerMax delivers remote replication over extended distances and across multiple sites enabling Always-On SAP. Run both mixed SAP workloads (production and non-production) and non-SAP applications on the same storage array. PowerMax is an effective partner with PowerEdge MX, and together the pair can lower infrastructure TCO.
Servers with Persistent Memory Support Data Management and Analytics Workloads

**Better: PowerEdge R840**

Dell EMC’s PowerEdge R840 also offers Intel® Optane™ DC Persistent Memory, as well as 15.36TB of DRAM memory for critical data-heavy workloads. Designed specifically to turbocharge your data analytics, this server gives you up to 26 drives to address large data sets and up to 24 NVMes for fast response times for business-critical workloads. It offers four processors for advanced performance and includes GPUs and FPGAs, which play a major role in analyzing unstructured data. The server includes 2nd Generation Intel® Xeon® Scalable processors with Intel® Deep Learning Boost, proven to deliver faster inferencing performance on neural networks.

The R840’s security features will be critical for organizations managing sensitive data (example: personal, financial or health-care related data). Test data is available supporting the previous generation of processors for this server’s suitability for running complex data analytics—and those findings will be even more impressive with the refreshed server available now.

**Award**

5-star review: “Designed to munch through demanding tasks such as artificial intelligence, machine learning and database analytics, Dell EMC’s PowerEdge R840 packs a mighty package into a slim-line 2U rack chassis.”

**Best: PowerEdge R940xa**

The PowerEdge R940xa is Dell EMC’s top-of-the-line analytics server. Like the R840, it has persistent memory packaged into a high-powered, memory-rich 4-socket server. The added benefit of the R940xa is extreme acceleration, thanks to a 1:1 ratio of GPUs to CPUs. Since GPUs have hundreds or thousands of cores, they are faster on certain tasks like numerical computations than CPUs. However, GPUs are only faster if the task can be parallelized. To avoid PCIe bottlenecks and use the full capabilities of CPU and GPU, it can be better to have a ratio of 1:1. Large memory capacity lets you take advantage of both in-memory and GPU and support large databases, minimizing bottlenecks. You can also use either four double-width or eight single-width FPGAs. The R940xa offers large internal storage with up to 32 drives—four of those can be NVMes—to support large data sets. You can easily expand externally with up to 12 PCIe slots. Plus you can automate everyday tasks to free up time for business innovations.

**Award**

One of the 10 hottest enterprise and business servers of 2018: “Designed to accelerate applications to deliver real-time decisions.”

Visit [DellEMC.com/Servers](http://DellEMC.com/Servers) to learn more.
Let Us Take the Work Out of Migrating to the New SQL Server

We are ready with the hardware you need to manage and analyze your data. We are also ready to support you with professionals who can work with you to navigate your Application Transformation.

Dell Technologies Assessment and Planning Service for Microsoft SQL Server Migration pairs our experts with yours to review documentation, integrations, and configurations of selected applications and their related SQL databases. Information collected regarding technical complexity, desired modernization pathway, and operational considerations will influence the plan we build. Together, we will explore migration and modernization opportunities, processes, tooling, and more to form a shared vision and desired path forward. At the end of the engagement, a clear and actionable modernization plan will be defined.

One urgent task you may be faced with is the end of extended support for SQL Server 2008. With the phasing out of this product comes the release of the new and improved SQL Server 2019, offering better encryption, faster database operations, and new advanced analytics solutions. The clock is ticking as organizations work to migrate applications and workloads. ProConsult Migration Services can help.

Does your team have the time and skills necessary to perform a SQL Server upgrade or migration? Dell Technologies Migration Consulting Services can step in and make sense of where you are, plan for the immediate future, optimize licensing and support costs, and migrate SQL Server to Azure, Azure Stack, the Dell EMC Ready Solutions for SQL, or any modern infrastructure your organization chooses as its future state platform. Dell Technologies is a certified Microsoft partner with a history of 30 years of partnership and related awards. Let us help take the work out of your migration as you seek to expand your data management and analytics capacities.

Learn more about Dell Technologies ProConsult Services.

Contact a Dell Technologies Services Expert today.

We Can Help You Build a Case for Migration to SAP HANA or Microsoft SQL Server 2019

Do you need to convince your management of the business case for migrating to SAP HANA or SQL Server 2019? Enter Dell EMC Live Optics. We can help create a defensible proposal, unique to your environment, using your Live Optics data. Take the guess work out of your data management and analytics workload plans and build a new infrastructure based on your actual needs.

Live Optics is a free, online software you can use to collect data about your IT environment. Nothing is more convincing than your own data, so take advantage of this tool to understand your organization’s needs and make a compelling argument to implement the latest data management and analytics applications.

Get started with Live Optics today.
Let’s make the data management and analytics transformation story real. Chances are, if you’ve ever rented an apartment, you’ve interfaced with RealPage. This Dell EMC customer has the largest database of lease transactions in the country and is the 10th largest Software-as-a-Service (SaaS) provider in the U.S. So it’s perhaps not surprising that it runs over 100,000 SQL Server databases.

RealPage prioritizes secure, scalable, and fast infrastructure so that its clients and data scientists can glean insights from massive amounts of data at incredible speeds. Before partnering with Dell EMC, it was struggling to keep up with the tremendous amount of scaling necessary, and leadership worried about its clients missing out on important and time-sensitive competitive information.

After choosing to work with Dell EMC, RealPage discovered the solution to its problems in the form of the PowerEdge R940xa. In this product, the company found the answer to its quest for tremendous scale and recently grew its relationship with one of its very large clients. “With this new extreme SQL server that came out, we’re now able to easily handle that workload and have demonstrated to our clients that we can easily add additional properties for them,” says Barry Carter, RealPage CIO.

Read the RealPage case study.

Watch the RealPage case study video.
Businesses can’t thrive on gut feel; they need hard data to support their decisions, and they need it quickly. The applications that provide this crucial intelligence require lightning-quick performance, lots of memory, and minimal downtime to prevent an organization from falling behind competitors. Dell EMC offers several excellent options for customers looking to optimize the performance of data management and analytics applications like SAP HANA and Microsoft SQL Server through Intel® Optane™ DC Persistent Memory. Let’s get the conversation started so that you can make the most of your data.

To learn more, contact a Dell EMC sales rep or visit DellEMC.com/Servers.