



Top Five Reasons for Microsoft SQL Server on FlexPod

Digitally Transform Your SQL Server Workloads

Digital transformation is changing commerce. IT needs to have the flexibility to alter their business-critical applications to accommodate these pervasive digital changes. Your business is evolving to embrace digital transformation so must your underlying Microsoft® SQL Server® databases and infrastructure.

FlexPod is a data center architecture solution and model that has changed and evolved to meet and exceed the needs of data center applications like Microsoft SQL Server for thousands of customers. MS SQL Server requires performance, cost-efficiency, scale, cloud-connection, consolidation all with security, agility, availability, and reliability. These requirements are a reality, and they are now part of the expected MS SQL Server experience for end-users and IT alike. To satisfy these needs,

IT users are moving toward pre-validated, cloud-connected, shared infrastructure. They're turning away from application silos and aiming towards pre-validated solutions such as **FlexPod®** for MS SQL Server, which can be quickly provisioned, scaled, changed, and repurposed while increasing agility, reliability, and efficiency and decreasing TCO.

To meet Microsoft's impetus to migrate End of Support versions, leverage cutting edge technology and avoid maintenance costs these fast-changing MS SQL requirements, Cisco and NetApp—through their FlexPod partners—deliver **standardized converged infrastructure for MS SQL Server**. FlexPod can handle mission critical MS SQL Server applications from hundreds to up to tens of thousands of users. In addition, MS SQL Server and other enterprise and cloud workloads use the same FlexPod architectural model with its industry-leading standardized



Top Five Reasons

Increase agility, lower licensing costs with better performance

Harness a software defined experience for both IT and end users

Leverage the power of FlexPod to manage and consolidate SQL Server

Deploy latest Microsoft SQL Server solutions with confidence

Migrate to private and hybrid cloud at your own pace

components: **NetApp® AFF** and FAS storage arrays, Cisco® **Unified Computing System™** (Cisco UCS®) servers, and Cisco **Nexus®** switches.

Increase Agility, Lower Licensing Costs with Better Performance

FlexPod delivers blazing Microsoft SQL server performance that can substantially lower licensing costs. FlexPod's UCS servers have set 10 SQL Server world record TPC-H benchmarks from SQL Server 2014 thru 2019. (TPC Transaction Processing Council is a decision support benchmark).

In addition, FlexPod AFF systems deliver industry-leading performance proven by SPC-1 (Storage Performance council) and SPEC SFS (industry-standard benchmark used to measure NFS file-system performance of network file servers) industry benchmarks, making them ideal for demanding, highly transactional applications such as MS SQL Server, Oracle, MongoDB databases, VDI, and server virtualization. With the power of front-end NVMe/FC host connectivity combined with back-end NVMe-attached SSDs, the FlexPod AFF systems deliver latency as low as 100µs, making them an optimal fit for your most demanding MS SQL Server workloads. In addition, recent FlexPod testing shows end-to-end NVMe giving over a 50% increase



“Delivery speed and integration speeds have increased. The solution has enabled us to run mission-critical workloads. Our SQL cluster is on there, which is high IOPS.”

System Engineer at a financial services firm
with 1,001-5,000 employees

IT Central Station FlexPod Reviews

in IOPs compared to FCH on FlexPod. Taken together these are high powered technologies add up to an ideal platform for SQL Server workloads whether a customer is leveraging NAS or SAN storage connection.

FlexPod also provides the ability to leverage Cisco® management software solutions, it can help simplify deployments and ongoing operations. FlexPod and Cisco management solutions— Cisco Intersight, Cisco Tetration, Cisco Workload Optimization Manager, and Cisco AppDynamics® running on FlexPod—deliver powerful capabilities to your Microsoft SQL Server and Always-On SQL Server environments. With these innovative tools, you can answer your questions and get the most out of your IT resources to improve efficiency, protect data, and reduce costs. Customers can also be assured that FlexPod and its unique, robust and thorough testing that all these management

solutions work seamlessly with your current enterprise and new workloads and workflows.

The Cisco AppDynamics suite of application and business performance monitoring solutions gives you visibility into every transaction and helps ensure that every part of the application ecosystem—FlexPod infrastructure, individual services, and business outcomes—is optimized for performance, cost efficiency, and quality of service. Using Cisco Tetration and Workload Optimization Manager with FlexPod, you define policies that build application dependency maps in real time to support application operation and enforcement. For example, you can track your SQL Server licenses against quotas, build policy fences, and receive alerts when conditions exist. The data collected by Cisco Tetration allows you to automatically move fenced workloads onto appropriate systems with Workload Optimization Manager.

Harness a Software Defined Experience for both IT and End Users

FlexPod is the perfect reimagined data center platform to host your ever-changing SQL Server needs. You can granularly and non-disruptively repurpose, add, or subtract compute, storage, and network resources. FlexPod for SQL Server truly delivers infrastructure as code. FlexPod abstraction comes from Cisco UCS compute and NetApp ONTAP® storage software that offer plug-ins, management packs, and commandlets that allow orchestration from UCS Director or Intersight manager or other third-party software. You can then scale, repurpose, change, add, and subtract SQL Server workloads for FlexPod quickly, efficiently, and in a standardized manner through software policy—not unplanned, error-prone processes. You can quickly and accurately address any spikes in SQL Server demand or lulls, whenever they occur. You can alter SQL Server compute and storage resources all in software. You can easily reallocate FlexPod resources from other workloads like databases back to VDI, or vice versa. Our solutions support a wide portfolio of high or less performant SQL workloads, and any additional FlexPod servers and storage scale with near-linear performance.

FlexPod's UCS servers provide the core of the data center infrastructure for SQL Server workloads. UCS drastically reduces the number of servers, switches, network interface cards (NICs), and host bus adapters (HBAs) needed, and the number of cables used per server. Because IT can rapidly deploy or re-allocate servers by using FlexPod UCS service profiles, operations are significantly simplified. Thousands of FlexPod servers running SQL Servers can be provisioned, maintained (firmware changes) quickly and efficiently through software. FlexPod software-abstracted infrastructure automates server provisioning makes end users productive more quickly, improves business agility, and frees up IT resources for other tasks.

Leverage the power of FlexPod to manage and consolidate SQL Server

FlexPod AFF arrays are viewed by Gartner to be in the leader quadrant for its AFF A-Series in the **2019 Gartner Magic Quadrant** for Primary storage. What makes FlexPod ONTAP storage arrays solutions different?

- High availability with instantaneous cloning, with rapid backup, and restore and fast recovery

- NetApp SnapCenter® software provides application-consistent data protection and clone management to simplify application management for SQL Server
- NetApp SnapMirror® technology replicates to any NetApp FAS or AFF system on the premises or in the public cloud, reducing overall system costs for SQL Server
- NetApp AFF A-Series storage arrays provide deep integration with Microsoft SQL and allows you to quickly provision storage in minutes
- Efficiency of 5 to 10 times with inline data compression, deduplication, and compaction; space-efficient LUN, file, and volume cloning; and automatic data tiering
- FlexPod ONTAP FabricPool automatically tiers, DR or replicate cold data to any cloud hyperscaler
- FlexPod Google Cloud recognized NetApp--and by extension ONTAP technology—as a unique partner that enables our joint customers to realize the benefits of the cloud through innovation

FlexPod also provides a joint Cisco/NetApp strategy and hundreds of thousands of hours of testing, thousands of SQL customers, and a deep partner network. FlexPod configurations are codified into design guides or detailed “cookbooks” for optimal deployment. These Cisco Validated Designs and NetApp Validated Architectures describe best practices for deploying SQL Server across a variety of different versions and scenarios.

FlexPod for SQL Server delivers industry-leading reliability also comes from its dual-redundant design in all areas of the architecture. Dual paths, NetApp Snapshot™ and SnapMirror™ copies, and software abstraction enable FlexPod to keep running even if any single component, path, server, data, switch, storage component, or storage controller is lost. Because all components are abstracted in software, any part of the infrastructure can easily be brought back into the design non-disruptively. Not only can SQL Server customers have bulletproof scalability: they can have scalability with reliability.

FlexPod delivers security leveraging its ONTAP storage arrays with flexible encryption and key management help guard your sensitive data on the premises, in the cloud, and in transit. With simple and efficient security FlexPod ONTAP storage arrays you can:

- Achieve FIPS 140-2 compliance (Level 1 and Level 2) with self-encrypting drives and use any type of drives with software-based encryption.
- Meet governance, risk, and compliance requirements with security features such as secure purge; logging and auditing monitors; and write once, read many (WORM) file locking.
- Protect against threats with multifactor authentication, role-based access control, secure multitenancy, and storage-level file security.

FlexPod has many happy customers. FlexPod for Microsoft SQL Server delivers TCO and many overall business benefits. A recent **IDC survey of FlexPod customers** found numerous advantages that accrued to IT clients of all sizes, including SQL Server:

65% more time spent on innovation and new projects

61% improvement in application performance

60% decrease in the number of unplanned downtime incidents

34% decrease in data center floor space

29% reduction in power and cooling

24% saved in software capital expenditures (capex)

Deploy the a Latest SQL Server solution with confidence

The FlexPod architectural standard also offers numerous tangible customer gains, including the following:

- You get one-call support for the entire FlexPod stack from Cisco, NetApp, or the FlexPod channel partner—faster time to resolution on any service issues with less finger-pointing between vendors.

- FlexPod is tested and battle proven, with more than 175 validated designs across nearly all data center and hybrid cloud workloads
- The FlexPod partner network is large and diverse with a wellspring of SQL Server knowledge
- You can connect to the cloud through your data fabric powered by NetApp technology and Cisco CloudCenter management software
- FlexPod uses block and file storage protocols that can be combined on the ONTAP storage arrays, offering a complete solution for VDI workloads without buying two sets of storage

Move to a Private or Hybrid Cloud at Your Own Pace

Your future may include a strategy to move to a SQL Server private cloud or a hybrid cloud or perhaps to stay on a virtualized on-prem infrastructure. Cloud strategies are as unique as fingerprints and FlexPod accommodates a diversity of customer scenarios:

- Virtualized infrastructure on-prem: FlexPod has SQL Server designs and leading hypervisor designs for all releases of SQL Server going back to SQL Server 2008, 2012, up to the latest on [SQL Server 2019](#).
- Hybrid Cloud: All FlexPod's leverage NetApp ONTAP-based storage, which enables DR, compliance, tiering, backup and archiving to any hyperScaler through data fabric technology powered by NetApp.

In addition, FlexPod supports other FlexPod combinations for Hybrid Cloud including:

- Integration of Cisco CloudCenter with FlexPod data center with ACI as the private cloud, Amazon Web Services (AWS) and Microsoft Azure Resource Manager (MS Azure RM) public clouds
- Providing secure connectivity between the FlexPod data center and the public clouds for secure Virtual Machine (VM) to VM traffic and NetApp Private Storage (NPS) for data replication traffic

- Ability to deploy application instances in either public or the private clouds and making up-to-date application data available to these instances through orchestration driven by Cisco CloudCenter

Begin Kicking the Tires on your FlexPod SQL Server Journey with Real Business Benefits

Today's FlexPod SQL Server infrastructure is software defined, standard, and proven to change as your SQL Server demands change. In lab tests, in real-world IT use cases, and throughout the world with thousands of delighted customers, FlexPod delivers happy SQL Server customers. Get started today on a converged infrastructure FlexPod for SQL solution that evolves with the needs of your business and customers.

- <https://flexpod.com/solutions/use-cases/microsoft-sql-server/>
- www.netapp.com/flexpod
- www.cisco.com/go/flexpod

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