Best Practices for

Upgrading SQL Server 2008/R2

BEST PRACTICES FOR UPGRADING SQL SERVER 2008/R2 03

TODAY'S CHANGING DATA PLATFORM REQUIREMENTS 04

UPGRADING TO AVOID SQL SERVER 2008 END-OF-SERVICE

UPGRADING SQL SERVER TO THE NUTANIX ENTERPRISE CLOUD PLATFORM 05

THE ADVANTAGES OF HYPERCONVERGED INFRASTRUCTURE FOR SQL SERVER 06

NUTANIX BENEFITS FOR SQL SERVER 07

CHALLENGES OF SQL SERVER WORKLOADS

BENEFITS OF UPGRADING SQL SERVER 2008/R2 TO SQL SERVER 2019 09

MOST IMPORTANT FEATURES IN SQL SERVER 2019

SQL SERVER MIGRATION STRATEGIES AND REQUIREMENTS 10

IN-PLACE UPGRADES

SIDE-BY-SIDE UPGRADES 11

BEST PRACTICES A SQL SERVER SIDE-BY-SIDE UPGRADE 12

KEYS TO SUCCESSFUL UPGRADE 14

POST UPGRADE

©2019 Nutanix, Inc. All Rights Reserved

Best Practices for Upgrading SQL Server 2008/R2

With Microsoft releasing the new SQL Server 2019 release many businesses are evaluating upgrading their existing SQL Server installations. Organizations that are running older versions of SQL Server can't take advantage of the many new benefits and features in the newer versions of SQL Server 2016 that enable businesses to handle today's demanding data platform requirements. This is especially true for businesses still running SQL Server 2008/R2 which hits the end of extended service on July 9, 2019. SQL Server is a core infrastructure component and upgrading it to a newer version is a critical task that if done correctly can provide many benefits to the organization. However, upgrading core infrastructure components like SQL Server also has associated risks and if something goes wrong there is the possibility of extended downtime. To successfully upgrade your SQL Server instances you need to prepare for the upgrade process with comprehensive planning and follow the best practices during the upgrade process. Otherwise, you can run into costly errors, upgrade problems and downtime.

In this whitepaper, you'll learn about the best practices for upgrading existing instances of SQL Server 2008/R2. First, we'll examine today's changing data platform requirements and dive into some of the most important reasons that businesses still using SQL Server 2008/R2 should upgrade to the new version of SQL Server. In many cases, older installations like SQL Server 2008/R2 are also running on dated hardware platforms and updating the database platform can be the ideal time to modernize the underlying hardware platform as well. You'll see how moving SQL Server to the modern Nutanix Enterprise Cloud platform can improve performance, availability and manageability for your enterprise database platform. Then you'll get an overview of the most important features and benefits that the newest SQL Server 2019 release has over SQL Server 2008/R2. Finally, you'll learn about the different migration strategies for upgrading to a new release of SQL Server and the best practices for upgrading SQL Server instances and databases as well as important post-upgrade checks.

©2019 Nutanix, Inc. All Rights Reserved

Today's Changing Data Platform Requirements

The data platform requirements of today have changed drastically since SQL Server 2008 was released 11 years ago. Back then the applications and workloads were fundamentally oriented around relational databases. While relational database are still important today, BI, analytics, Big Data and the cloud have taken on much bigger roles for most businesses and the newer version of SQL Server have evolved to meet these requirements in ways that the older SQL Server 2008/R2 release was never designed to. Today's enterprise data platform needs to be able to integrate with Hadoop and other Big Data platforms, run analytics using languages like Python and R as well as seamlessly extend to the hybrid cloud.

In addition, most businesses today are dealing with massive data growth. Gartner has predicted that data is growing at a rate of 30-50% per year. Similarly, IDC has predicted that data requirements will double every two years. Your infrastructure needs to handle this explosive data growth while also maintaining consistent performance and availability levels. Data growth not only directly impacts storage but it also affects availability, backup and data protection requirements. Upgrading to the new SQL Server 2019 release provides businesses with the modern features that they need to deal with today's more demanding data platform requirements.

Upgrading to Avoid SQL Server 2008 End-of-Service Problems

If you're running SQL Server 2008 or SQL Server 2008 R2 it's important to upgrade SQL Server before passing the end of the extended support period which is July 9, 2019. One important consideration for upgrading is the fact that using an old outdated release like SQL Server 2008/R2 means that your business lacks all the new enhancements and features found in the new releases. However, that's not the biggest problem in continuing to run your business critical applications on unsupported release.

There are real security risks in continuing to run a non-supported release of SQL Server. When a release is no longer supported Microsoft ceases making any security updates for the release. This makes the release potentially open to vulnerabilities. If an exploit is developed for the older SQL Server 2008/R2 release it can be readily exploited and Microsoft will not be releasing patches for it. Exploits that infect the older SQL Server 2008/R2 release can then potentially spread to the other systems in your organization. This makes SQL Server 2008/R2 a significant security risk.

Compliance with various regulatory standards is another important reason to upgrade your SQL Server 20098/R2 systems when they reach the end-of servicing. Many businesses running SQL Server need to comply with various regulatory standards and most regulatory standards like HIPAA, SOX, GDPR and others require that all software components are supported and updated. In other words, the software must be supported in order to meet compliance regulations. Running an out of service release like SQL Server 2008/R2 would cause your organization to fall out of compliance which could result in fines and other penalties.

In addition, running unsupported software essentially means that you can no longer get technical support from Microsoft. For normal operations this isn't a huge factor for most business as SQL Server 2008/R2 is very stable and has been running in the field for over a decade. However, unexpected events can and do occur and things like a system hardware, OS or other software failure could cause a SQL Server 2008/R2 database outage.

Without Microsoft technical support to fall back on this type of unexpected failure could be the cause of extended downtime which can be very costly to your business. Downtime can easily cost more than the price of upgrading your SQL Server instances.

©2019 Nutanix, Inc. All Rights Reserved

Upgrading SQL Server to the Nutanix Enterprise Cloud Platform

When you are planning to upgrade your SQL Server 2008/R2 database instances it also make sense to reevaluate the platform that they run on. For many businesses the computing platform that they are using to run SQL Server 2008/R2 is also dated and in many cases over a decade old. Moving to a modern hardware platform can enable you to maximize the benefits of the database upgrade. Today many businesses are adopting hyperconverged infrastructure (HCI) platforms as they modernize their data centers. According to Gartner, 20% of mission-critical applications currently deployed on three-tier IT infrastructure will transition to HCI by 2020.

Nutanix is a widely recognized leader in HCI. Both Forrester and Gartner have ranked them at the top of their HCI technology comparisons. In the Forrester Wave for Hyperconverged Infrastructure Q3 2018 Nutanix was ranked as the strongest current offering out of the top ten different HCI vendors. In their Magic Quadrant for Hyperconverged infrastructure for 2018 Gartner ranked Nutanix as the leader both in the ability to execute and in their completeness of vision categories. You can see the latest Gartner Magic Quadrant for Hyperconverged infrastructure in Figure 1.

Figure 1 – Gartner Magic Quadrant for Hyperconverged Infrastructure

©2019 Nutanix, Inc. All Rights Reserved

The Advantages of Hyperconverged Infrastructure for SQL Server

Nutanix HCI provides many significant advantages for running tier 1 applications like SQL Server over traditional three-tiered infrastructure which can be complex, expensive and difficult to operate. HCI simplifies server deployments while still providing enterprise-level performance and scalability. HCI uses a flexible building block type of architecture that combines a collection of cluster nodes where each node consists of x86-based compute, memory, storage, and virtualization capabilities. You can select the compute and memory resources of each node as well as choosing flash SSD and/or HDDs to meet your own custom workload requirements. Nutanix HCI solution is hardware agnostic providing freedom of choice for the computing platforms that you want to use. Nutanix offers their own line of HCI applications. In addition, the Nutanix Enterprise Cloud Platform is also available on industry-leading OEM platforms from Dell EMC, Fujitsu, HPE, IBM, Inspur, and Lenovo. Intelligent cluster management software enables the cluster to aggregate resources as well as providing scalability and availability. Nutanix HCI provides linear performance scalability by simply adding more nodes to the cluster. You can see a comparison of legacy three-tiered architecture and HCI in Figure 2.

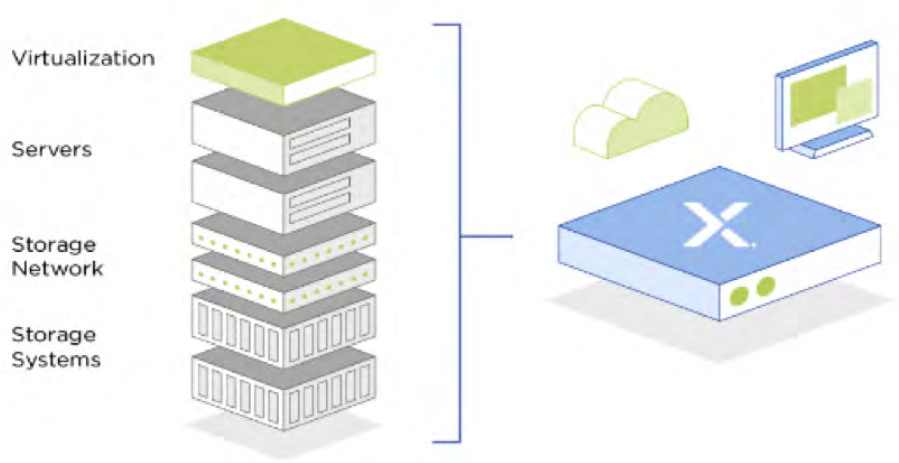

Figure 2 – Comparing legacy three-tiered vs. HCI architectures

Legacy three-tiered architectures consist of multiple components that typically come from separate vendors complicating your deployment and management requirements. It's common for one vendor to provide the x86 servers, another vendor to provide the networking switches, another vendor typically provides the storage and still another vendor provides the virtualization support. HCI makes deployment and management far simpler. Compute, memory, storage and networking are all provided in a single node and multiple nodes can be combined to increase scalability and performance. All of the nodes can be managed as a single entity. Using HCI can allow you to eliminate expensive external SAN by aggregating high performance local storage from each of the HCI cluster nodes.

©2019 Nutanix, Inc. All Rights Reserved

Challenges of SQL Server Workloads

SQL Server has several difficult challenges running as a tier one enterprise workload. SQL Server is a resource intensive workload that requires specialized IT resources as well as very high levels of performance and availability. As an enterprise data platform, SQL Server has high data protection requirements. However, database recovery and new deployments can be slow and complex. Additionally, effectively dealing with growing database storage requirement is also a huge issue today. Not only are modern databases growing rapidly with the inclusion of new data types like Big Data but most businesses today also have the problem of managing multiple copies of their databases that are typically stored on expensive external SANs. An IDC Copy Data Management report showed that 45% to 60% of total storage capacity is dedicated to storing copy data and that 82% of organizations have at least 10 copies of their production databases. These issues are all amplified when the databases are run on a wide variety of legacy software and hardware technologies. Let's take a closer look at how Nutanix can address these SQL Server challenges.

Nutanix Benefits for SQL Server

Nutanix HCI is very well suited to running tier 1 workloads like SQL Server. Today's SQL Server deployments are compute and I/O intensive and they need to handle a mix of diverse workloads with low latency. SQL Server instances support two main types of workloads: relational database OLTP workloads and data warehousing OLAP workloads. Each of these different types of workloads has very different processing and I/O requirements. OLTP workloads consist of short random write-heavy I/O that require very low latencies. OLAP workloads are read-heavy with larger data transfers that can tolerate longer latencies. In a traditional three-tiered architecture you would normally need to separate these workloads on to different host platforms with different storage configurations for each workload. Nutanix allows you to consolidate both types of SQL Server workloads onto a single HCI platform providing high performance for both. Some of the main advantages of running SQL Server on Nutanix are:

- Support for VMs and bare metal implementations – While the vast majority of today's enterprise database workloads run in VMs there are instances where businesses want to run SQL Server on bare metal to get the absolute best performance possible. Nutanix supports SQL Server equally well in a VM or as a bare metal installation.

- The ability to customize your HCI configuration to match your workloads requirements – Nutanix nodes are complexly customizable, allowing you to configure the exact processor, memory and storage resources that you need to meet your SLAs. This enables you to avoid unnecessary expenditures by only purchasing the computing resources are required for your workloads.

- Can eliminate the need for an external SAN – Nutanix nodes can aggregate their storage and present that storage to the applications as a single pool. The storage itself can consist of all-flash SSDs or a combination of SSDs and HDDS. Nutanix can provide automatic data tiering to move hot data to SSD drives and cooler data to slower HDDs. SQL Server indexes and key database files can be stored on local high performance SSDs for low latency operations. Likewise, local SSD storage can provide high performance read operations for OLAP queries and reports.

- Simple linear scalability – Scaling Nutanix clusters is far easier than scaling traditional servers. To scale a traditional server you might have to take the server down and update the CPUs or memory or even in some cases replace the entire server. Scaling Nutanix clusters is far easier. Simply adding additional nodes to a Nutanix HCI cluster can provide linear scalability with no downtime.

©2019 Nutanix, Inc. All Rights Reserved

- Radically simplify SQL Server storage configuration – When SQL Server is implemented with traditional SAN storage you need to pay particular attention to the placement of tempdb as well as the database data and log files. Tempdb and log files need to be placed in low latency volumes that support high performance write operations and they are often configured with RAID 1 while data files are typically placed on volumes with high read performance that are using RAID 5 or RAID 10. Nutanix makes storage far simpler. Nutanix HCI doesn't have the concept of RAID. Instead, Nutanix-presents a single pool of storage that can handle both types of workloads simultaneously.

- Provides built-in high availability and data protection – Nutanix provides enterprise-level high availability and data protection that's built-in to its HCI clusters. Data is synchronously replicated across multiple nodes in the cluster. If a drive fails then the data is automatically rebuilt on another drive in the cluster without impacting the on-going operations. If a cluster node fails the other nodes in the cluster will automatically repopulate the data that was on that node and restart any VMs that were running on the node. The greater the number of nodes in the cluster the faster the rebuild process. These HCI availability features work separately and independently from SQL Server's additional availability options. Nutanix HCI also provides non-disruptive upgrades for your HCI clusters with no impact to on-going database operations.

- Built-in disaster recovery (DR) capabilities – Nutanix provides built-in multi-site replication that can replicate your VMs locally or to a remote site. The replication is based on a schedule that can be customized per workload. Nutanix supports 1:Many, Many:1 and Many:Many replication scenarios. Nutanix provides the ability to backup VMs locally, to a remote site or to the cloud using Cloud Connect. Nutanix integrates with many 3rd party DR solutions. In addition, Nutanix offers their cloud-based DR-as-a-Service (DRaaS) Xi Leap solution which takes care of the effort and complexities involved in implementing DYI DR plans.

- Single pane of glass management – Nutanix Prism provides a single pane of glass management capability that enables you to manage Nutanix server clusters, storage and alerts from a single console. Beyond basic management, Prism also provides deep analytics, reporting, a self-service portal and capacity planning

- Nutanix Era capabilities – Providing automated and simplified database management, Nutanix Era address today's troublesome database and copy data problems. Era enables you to deploy databases in just a few minutes or hours versus the days or weeks it might take to manually deploy new databases. One-click provisioning enables up to 10X faster dev/test deployment by enabling you to provision, clone, refresh, and back up your databases with a single click. Era also eliminates wasteful copy data costs with the ability to create zero-byte database clones based on any point in time. Cloud style management provides self-service database deployment, lifecycle management and database patching.

©2019 Nutanix, Inc. All Rights Reserved

Benefits of Upgrading SQL Server 2008/R2 to SQL Server 2019

QL Server 2019 adds a number of important new features that significantly extend its capabilities as an enterprise data platform over the older SQL Server 2008/R2 release. Since the time that SQL Server 2008/R2 was released Microsoft has released five major versions of SQL Server: SQL Server 2012, SQL Server 2014, SQL Server 2016, SQL Server 2017 and the newest SQL Server 2019 release. In that time Microsoft has added quite a number of new features to SQL Server.

Most Important Features in SQL Server 2019
There are far too many new features in the SQL Server 2019 release that are not present in the older SQL Server 2008/R2 release to list them all but some of the most important enhancements include:

- AlwaysOn Availability Groups (AGs) –AlwaysOn AGs provide database-level high availability and disaster recovery for multiple databases with automatic failover and client redirection. The Enterprise edition of SQL Server 2019 supports up to eight secondary replicas with five synchronous replicas. Standard edition Basic AlwaysOn AGs are limited to two servers and a single database.

- In-Memory OLTP – Designed to increase the performance of OLTP workloads, In-Memory OLTP provided a memory resident relational database engine that processes data in memory using a fully optimistic concurrency control model. Microsoft states that there can be up to 30X improvement for certain workloads.

- Columnstore Index – Designed to increase the performance for data warehousing queries, the Columnstore Index combines column-wise data organization with extreme data compression to accelerate data warehousing and analytical queries. Microsoft states some workloads can be improved by 100x using the Columnstore Index.

- Always Encrypted – Always Encrypted enables you to protect your critical data from hackers and even highly authorized administrators. When Always Encrypted is enabled for a database, all of the data is encrypted on the disk preventing access even for database administrators. The data is encrypted and decrypted using drivers in the client application.

- Row-Level Security (RLS) – RLS enables you to restrict access to rows in a database table based on the profile of the user or role executing a query. Data access restriction logic is located in the database tier reducing application development requirements.

- Dynamic Data Masking (DDM) – DDM is a data privacy feature that enables you to selectively mask sensitive column data depending on the user or role that accesses that data. The data itself is not masked or encrypted in the database. Instead it is masked when it is surfaced by client applications. Data masking logic in stored in the databases and built-in functions provide data masking for several built-in data types as well as custom data masking.

- Resource Governor – Designed to enable you to limit an application's ability to monopolize system resources, the Resource Governor enables you to limit the amount of CPU, memory or I/O that an application can consume.

©2019 Nutanix, Inc. All Rights Reserved

- Query Store – The Query Store is intended to help you troubleshoot performance issues. It's enabled on an individual database basis and it automatically captures the history of queries, plans, and runtime statistics.

- Stretch Databases – Stretch Databases enable you to seamlessly extend a database from an on-premise SQL Server instance to the Azure cloud allowing you to store infrequently accessed data in low-cost cloud storage while keeping frequently accessed data on high performance local storage. Under the covers, the wizard creates a Linked Server to the cloud database and no application changes are required.

- Polybase – Polybase enables you to bridge both relational data with Big Data sources like Hadoop and Azure Blob Storage. Polybase lets you use Transact-SQL (T-SQL) statements to access data stored in both relational and big data stores as well as join the results of both data sources.

- SQL Server on Linux & Docker – Since the release of SQL Server 2017, SQL Server is now supported natively on Linux and in Docker containers. The current support is primarily for the relational database engine but there is also support for AlwaysOn AGs, Replication, SQL Server Integration Services and SQL Agent. Microsoft provides Docker containers for Red Hat Enterprise Linux and Ubuntu.

SQL Server Migration Strategies and Requirements

There are two main strategies for upgrading to a new release of SQL Server.

- In-place upgrade – Upgrades the SQL Server instance on the server where it is currently installed -- essentially installing the new SQL Server version over top of the older SQL Server version.

- Side-by-side upgrade – Install a new SQL Server instance on a different server. Configure that server to match the older server's settings and then move the databases to the new server.

In-Place Upgrades
An in-place upgrade is simpler than a side-by-side upgrade but it also has more risk associated with it. In general, you can upgrade from your current edition of SQL Server to the equivalent or higher editions. For instance, you can upgrade from the SQL Server 2008 Standard edition to the SQL Server 2016 Standard or Enterprise editions. But you can't upgrade from the SQL Server 2008 Enterprise edition to the SQL Server 2019 Standard edition. For a complete list of supported upgrade paths for SQL Server 2019, you can refer to Supported Version and Edition Upgrades. You cannot add new features during an in-place upgrade.

To perform an in-place upgrade, you essentially run a full server backup for the SQL Server system and followed by a full backup of all of your databases. Next you run an upgrade installation of the new version of SQL Server on your existing SQL Server system. You can see the option for performing an in-place upgrade from SQL Server Installation Center in Figure 3.

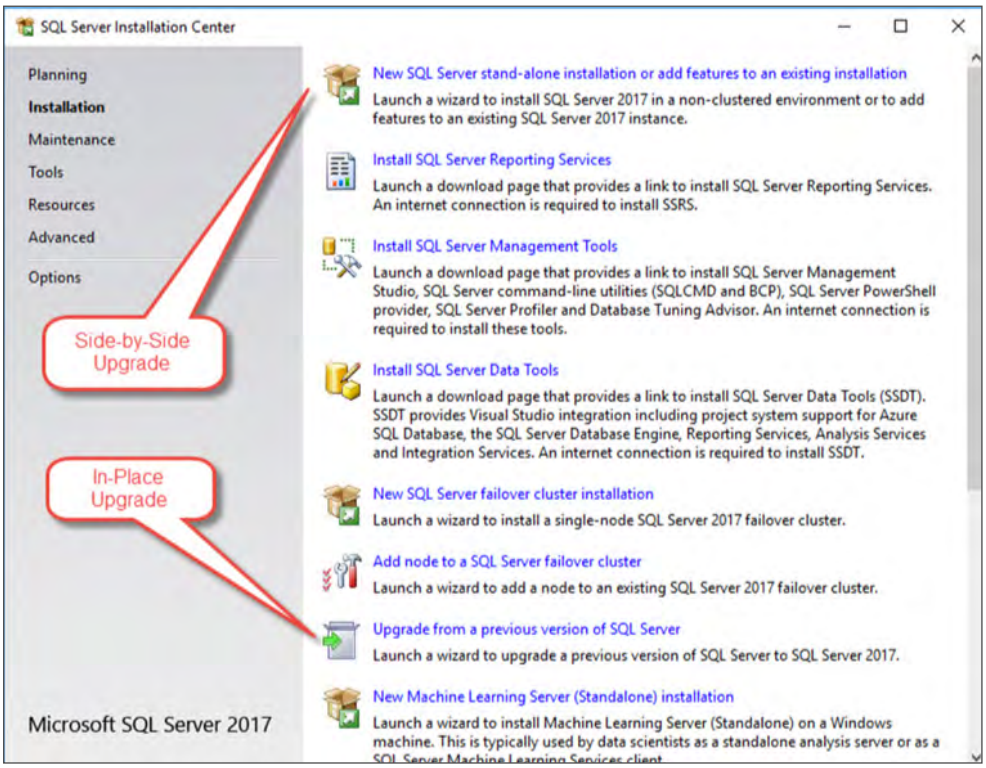

Figure 3 – Performing an In-Place upgrade from SQL Server Installation Center

Side-by-Side Upgrades

Instead, the vast majority of database professionals prefer the side-by-side upgrade approach. The side-by-side upgrade gets its name from the fact they you will have two SQL Server instances running at the same time – your older instance which you are upgrading and your newer SQL Server instance. With the side-by-side method, production databases remains available on your old system while you perform the installation and configuration of the new system. This method also avoids any possible problems that could occur during the upgrade process itself. The side-by-side upgrade takes more time and tends to be more costly because you often upgrade the server platform and operating system in addition to the SQL server release. However, it is also safer and more reliable and has virtually no downtime. The side-by-side method requires a new installation of the operating system as well as a new SQL Server installation. This ensures that you have the most up-to-date and stable platform possible and it eliminates the registry and system corruption that tends to creep into Windows installations. After deploying a new SQL Server release, you need to restore your custom SQL Server settings, properties, logins and jobs. Finally, you need to backup and restore all of your databases to the new SQL Server instance.

©2019 Nutanix, Inc. All Rights Reserved

The SQL Server instance will be unavailable during the time that it takes the upgrade to complete. This length of time depends on how powerful the system is as well as the number of SQL Server options installed. It's not unusual for this to take a half an hour to an hour or more. You still need to perform backups before the upgrade process to enable you to restore your data if something goes wrong during the upgrade process. However, if the upgrade succeeds without any problems then you won't need to restore your databases at the end of the upgrade process. All of your server and database settings will be preserved and the SQL Server instance will be ready to run after the upgrade process completes. While faster overall, this method does have downtime during the upgrade process. There is also risk involved. While the upgrade process is reliable, it has been known to fail. If the upgrade process encounters errors and doesn't go as planned, then you will need to resolve those errors before your database server can come back online. In severe cases this might require you to restore the complete system from backup which can take a significant amount of time. To avoid this risk of downtime most database professionals only opt to use in-place upgrades for systems that are not critical.

Process	In-place Upgrade	Side-by-Side Upgrade
Number of resulting instances	One only	Two or more
Number of servers requires	One	Two or more
Data file transfer	Automatic	Manual
SQL Server instance configuration	Automatic	Manual
Support tool	SQL Server Setup	Various

Figure 4 – Comparing in-place and side-by-side upgrades

Best Practices for a SQL Server Side-by-Side Upgrade

The essential steps for performing a side-by-side upgrade are as follows:

1. Download and run the Data Migration Assistant – Use the Data Migration Assistant to identify and correct any known compatibility issues before beginning the upgrade.

2. Select the target platform – Select the platform that will host the new SQL Server instances. This can be either a physical server or a VM. Many businesses choose to upgrade their hardware platform to maximize the benefits of upgrading to a new release of SQL Server and Nutanix HCI offers many benefits for tier 1 applications like SQL Server.

3. Verify the target system – Confirm the target server has adequate compute, memory, storage and NICs to accommodate the workload of the server being migrated.

4. Install the new OS – Install and configure Windows Server 2016 or one of the supported Linux distributions on the new server instance. Install any required OS updates.

5. Install SQL Server 2019 on the new instance – Install the new SQL Server target instance. You can also optionally add new features to the SQL Server deployment. Install any required SQL Server updates.

©2019 Nutanix, Inc. All Rights Reserved

6. Backup a set of test databases on the old system and restore them to the new SQL Server instance – Make an initial backup copy of your databases for validation testing.

7. Restore all of the original SQL Server instance and database configuration values – Configure the new SQL Server instance with the server and configuration values from your old system. The best practice is to create a configuration script. This makes it easy to apply your server configuration to new SQL Server instances.

8. Copy logins, permissions, jobs, as well as any lined servers and cryptographic keys from the old instance to the new SQL Server instance – Move these objects to the target SQL Server instance. Here again, the best practice is to create a script that can be easily rerun. An open source PowerShell script called dbatools can assist in this object migration. You can download it from the Microsoft Script Center at Use PowerShell to Migrate SQL Server Instances or from Download dbatools.

9. For initial testing set your new SQL Server instance to the DB compatibility level of the older SQL Server instance – Each new release of SQL Server uses a new Cardinality Estimator (CE) to create query plans. Setting the DB compatibility level to match your old release will enable you to test your critical queries ensuring that you are getting the required level of performance.

10. Enable the Query Store on your test databases –The Query Store enables you to capture the query plans and performance characteristics of your workloads.

11. Execute a test workload on the old server instance to establish baseline – Create a performance baseline of your critical queries on your old server so you have a verifiable way to know that your new SQL Server setup is delivering the required performance levels.

12. Execute the test workload on the new server instance and compare to the baseline – Run the workload on the new server with your old database compatibility levels to ensure you're getting equal or better performance with the new platform and SQL Server release.

13. Change Compatibility Level to 150 and rerun test workload and compare it to the baseline – Change the compatibility to 150, which is the latest compatibility level for SQL Server 2019. Then rerun the test workload and compare the results with the previous workload to determine if you can use the newest CE.

14. Use Query Store to detect regressed plans – After both workloads have been run, you can use the Query Store to detect regressed workloads. This will enable you to see if any critical queries are not performing as well with the newer compatibility levels. If there is regression you can examine the query plans and revise the queries or force problem query plans to a previous compatibility level. If there is a significant issue then you can revert the database back to the previous compatibility level.

15. Backup and restore the production databases to the new SQL Server release – After successfully completing compatibility testing move the production databases and cut the users over to the new server. You can optionally use DNS or a SQL Alias to redirect client connections from the old SQL Server instance to the new SQL Server 2016 instance.

©2019 Nutanix, Inc. All Rights Reserved

Post Upgrade

Following the upgrade there a few tasks that you should perform to make sure everything is has been migrated successfully.

- Run SELECT @@VERSION – This will allow you to verify the new SQL Server build number, production level and edition name.
- Perform a database object count verification – This will ensure that you are not missing any database objects following the upgrade process.
- Run new database backups – Create new backup of your production databases from the new server.
- Optionally rebuild the full-text catalog – If you're using full-text search you should rebuild the catalog on the new server.
- Decommission the old server – After the migration has successfully completed you can repurpose or decommission the old server. If the server was a VM you can take it offline and archive it.

Keys to Successful Upgrade

Following these upgrade best practices can help you to evaluate the advantages of moving SQL Server to the Nutanix HCI platform as well as ensuring that you have a successful and error-free SQL Server upgrade with minimal downtime.

NUTANIX™
YOUR ENTERPRISE CLOUD

T. 855.NUTANIX (855.688.2649) | F. 408.916.4039
info@nutanix.com | www.nutanix.com | @nutanix

Nutanix makes infrastructure invisible, elevating IT to focus on the applications and services that power their business. The Nutanix enterprise cloud platform leverages web-scale engineering and consumer-grade design to natively converge compute, virtualization and storage into a resilient, software-defined solution with rich machine intelligence. The result is predictable performance, cloud-like infrastructure consumption, robust security, and seamless application mobility for a broad range of enterprise applications. Learn more at www.nutanix.com or follow us on Twitter @nutanix.

©2019 Nutanix, Inc. All rights reserved. Nutanix is a trademark of Nutanix, Inc., registered in the United States and other countries. All other brand names mentioned herein arefor identification purposes only and may be the trademarks of their respective holder(s).