

SQL Server Install CheckList and Learning Resource

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Installation Process Categories

Pre-Installation Planning

1. Agree on the instance name.

A default instance name is just the name of the machine that SQL Server is installed on while a named instance is in the format of ServerName\NamedInstance. You can only have one default instance per computer, but can install multiple named instances on the same computer. This is often called instance stacking, and should be done carefully, or not at all, as the multiple instances of SQL Server are forced to share resources with one another. This can lead to unintended resource contention.

2. Review hardware requirements.

<https://docs.microsoft.com/en-us/sql/sql-server/install/hardware-and-software-requirements-for-installing-sql-server-ver15?view=sql-server-ver15>

3. Identify/create service accounts for SQL Server & SQL Server Agent.

This step includes considering the use of a domain account for any SQL Server that will need to access resources outside of itself, such as other computers. A Managed Service Account or a Group Managed Service Account is another option. For these types of accounts, Active Directory manages and changes the password for you automatically. This helps keep accounts more secure and frees the DBA or a SysAdmin from periodically making password changes to enhance security.

<https://docs.microsoft.com/en-us/sql/database-engine/configure-windows/configure-windows-service-accounts-and-permissions?view=sql-server-ver15>

4. If SSIS/SSRS/SSAS will be used then they also need service accounts.

It is best practice for each service to have its own service account because if you use the same account for all services and that account becomes compromised, then all components of SQL server are compromised.

5. Choose between Windows and SQL authentication. Most commonly SQL Server installs use both.

6. Ensure drives where SQL Server will be installed are set to proper allocation unit size.

<http://www.sqlnuggets.com/setting-drive-allocation-unit-size-with-powershell/>
<https://www.virtual-dba.com/blog/disk-configuration-optimized-sql-server/>

7. Identify/create drive letters for .mdf, .ldf, and .ndf files

On physical machines, it is very important to split up the data and log files onto separate drives because of different IO patterns as well as IOPS and throughput (megabytes/sec) limits. This is also true if you are using something like ebs storage for AWS ec2 instances. With high speed flash storage, this seems to be less of an issue.

Still, for ease of management and consistency, I recommend using a standard so that the installations look the same.

I like mnemonic devices and so the L and T drives below relate to the Log and TempDb respectively due to starting with the same letter. Because the D drive is often used for a disk drive on a machine, it may not always be available. If it is, I would use the D drive for the Data files for SQL Server.

E Drive for the root directory for the SQL Server install. This would include your System databases.

D or F drive for default directory for the data files (.mdf and .ndf) for your user databases

L for SQL Logs

T for TempDb

8. Plan for TempDb best practices

Consider typical best practices for TempDb - often one .ndf for each CPU core up to 8 .ndf files.

<https://docs.microsoft.com/en-us/sql/relational-databases/databases/tempdb-database?view=sql-server-ver15#optimizing-tempdb-performance-in-sql-server/>

9. Ensure the power plan for the computer is set to high performance.

<https://blog.sqlauthority.com/2019/08/13/sql-server-power-options-power-plans-and-database-performance/>

10. Assign the SQL Server service account to the "Performance Volume Maintenance" permission.

<https://www.sqlskills.com/blogs/kimberly/instant-initialization-what-why-and-how/>

<https://www.brentozar.com/blitz/instant-file-initialization/>

https://blogs.msdn.microsoft.com/sql_pfe_blog/2009/12/22/how-and-why-to-enable-instant-file-initialization/

11. Test your storage with CrystalDiskMark.

Before installing SQL Server, test the storage attached to your future SQL Server.

<https://crystalmark.info/en/software/crystaldiskmark/>

Install SQL Server

1. Be sure only to install the components needed rather than installing all or a variety of unneeded components. This reduces the area of attack and keeps resource utilization focused on just the components that need the resources.

<https://docs.microsoft.com/en-us/sql/database-engine/install-windows/install-sql-server-from-the-installation-wizard-setup?view=sql-server-ver15>

2. Review patch level and update SQL Server.

If this is a new stand alone SQL Server, then update it to the latest available patch level. If this is part of a failover cluster or AlwaysOn Availability Group, then be sure to update the patch level to the same level as existing production servers so that functionality is the same on all SQL Servers

<https://sqlserverbuilds.blogspot.com/>

Post Install Config

1. Set any trace flags. If this SQL instance is to mirror another instance then see link on how to find what trace flags are enabled.

<http://blog.sqlauthority.com/2014/11/02/sql-server-what-are-my-trace-flags-enabled-on-sql-server/>

<https://docs.dbatools.io/Get-DbaTraceFlag/>

<https://docs.dbatools.io/Enable-DbaTraceFlag/>

2. Set MAXDOP

<https://docs.microsoft.com/en-us/sql/database-engine/configure-windows/configure-the-max-degree-of-parallelism-server-configuration-option?view=sql-server-ver15>

<https://docs.dbatools.io/set-dbaMaxDop>

3. Set Cost Threshold for Parallelism

The default of 5 is too low and this will cause small cost queries to go parallel needlessly. I would encourage a default of at least 25 or maybe even 50.

<https://docs.microsoft.com/en-us/sql/database-engine/configure-windows/configure-the-cost-threshold-for-parallelism-server-configuration-option?view=sql-server-ver15>

<https://callihandata.com/2021/11/15/deciding-cost-threshold/>

4. Consider setting Optimize for ad hoc workloads

<https://www.sqlskills.com/blogs/kimberly/plan-cache-and-optimizing-for-adhoc-workloads/>

5. Configure TempDb files

Pre-grow out the mdf and ndf files to account for about half the drive space on your dedicated TempDb drive.

<https://www.mssqltips.com/sqlservertip/6493/sql-server-tempdb-tutorial/>

6. Set backup compression

Backup compression will save as much as 50% on the size of backups, saving storage space.

<https://docs.microsoft.com/en-us/sql/relational-databases/backup-restore/configure-backup-compression-sql-server?view=sql-server-ver15/>

7. Create a DBA or DBAUtility database and put your troubleshooting scripts in it. Ola Hallengren, Brent Ozar's First Responder Kit, Sp_WhoIsActive, and Kenneth Fisher's permissions scripts.

<https://ola.hallengren.com/>

<https://github.com/BrentOzarULTD/SQL-Server-First-Responder-Kit/>

<https://github.com/sqlstudent144/SQL-Server-Scripts/>

<http://whoisactive.com/>

https://github.com/amachanic/sp_whoisactive/releases

8. Configure schedules for the Ola Hallengren agent jobs

<https://logicalread.com/scheduling-sql-server-jobs-with-sql-agent-mo01/>

9. Set max memory for SQL Server

I.T. professionals are often surprised at how much memory SQL Server can consume on a machine and think there is something wrong. That is not necessarily the case. There are some guidelines though and what value to use is dependent on a number of things, like how many SQL Server components are installed, whether other applications are installed on the SQL Server (which there shouldn't be any, ideally), what version and edition of SQL Server is present and the maximum memory on the machine.

<https://leemarkum.com/archive/2015/12/setting-min-and-max-server-memory-setting/>

<https://docs.dbatools.io/Set-DbamaxMemory/>

10. Set up network protocols for SQL Server instance using the SQL Server configuration Manager to enable the TCP/IP protocol.

<https://www.sqlshack.com/how-to-use-sql-server-configuration-manager/>

11. Add the new SQL instance to the Central Management Server

This is a recommendation as part of maintaining a SQL Server inventory. You can't manage a SQL Server if you don't know it exists. A Central Management Server provides a list of your SQL Servers and allows for querying multiple instances at the same time. Central Management Servers also allow for a central location to administer any Policy-Based Management policies.

<https://docs.microsoft.com/en-us/sql/ssms/register-servers/create-a-central-management-server-and-server-group?view=sql-server-ver15/>

<https://docs.microsoft.com/en-us/sql/ssms/register-servers/execute-statements-against-multiple-servers-simultaneously?view=sql-server-ver15/>

12. Configure Database Mail

<https://www.mssqltips.com/sqlservertip/1100/setting-up-database-mail-for-sql-server/>

13. Create a SQL Agent Operator to notify with Database Mail

<https://leemarkum.com/archive/2016/12/fixing-jobs-with-no-email-notification/>

14. Create a SQL Server Agent job to test Database Mail.

Create a SQL Server Agent job and name it Test Database Mail. Add a step with a T-SQL expression that will fail so that the job will attempt to notify the agent operator that has been assigned to it. Execute the job, and within a few minutes, an email should be received at the address designated in the SQL Operator assigned to the job. This will test whether your database mail is set up correctly. If no email was received, then additional troubleshooting is required to ensure that Database Mail is working properly.

<https://docs.microsoft.com/en-us/sql/ssms/agent/create-a-job?view=sql-server-ver15>

15. Create default alerts for error severities 16-25.

<https://glennsqlperformance.com/2020/01/20/sql-server-agent-alerts-for-critical-errors/>

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<https://leemarkum.com/services/>