

Summary of the properties of SQL Server Express vs Standard or Enterprise

Generally valid parameter for sufficient performance:

SQL Express: max. 100 DB inserts per sec.

Negative influence on performance:

SQL Express version

SQL Express database with project files larger than 1GB

Positive influence on performance:

Min SQL Server 2017 (Standard, Enterprise - not Express).

Install SQL DB Standard instead of SQL Express

Even if this is not currently the problem, due to the database size it will become a problem.

https://www.microsoft.com/de-de/sql-server/sql-server-2017-editions

Testo Extern Luftfeuchtigkeit im...

Vergleich der SQL Server 2017-Editionen

Umfassender [Feature-Vergleich](#) der SQL Server 2017-Editionen mit Details und Einschränkungen der Features.

Verfügbarkeit von Features

☐ Nicht unterstützt ☒ Vollständig unterstützt

Features	SQL Server 2017 Enterprise	SQL Server 2017 Standard	SQL Server 2017 Express	SQL Server 2017 Developer
Skalierung				
Maximale Anzahl von Kernen	Unbegrenzt	24 Kerne	4 Kerne	Unbegrenzt
Speicher: Max. Pufferpoolgröße pro Instanz	Max. Betriebssysteme	128 GB	1410 MB	Max. Betriebssysteme
Speicher: Max. Spaltenstore-Segmentcache pro Instanz	Max. Betriebssysteme	32 GB	352 MB	Max. Betriebssysteme
Speicher: Max. speicheroptimierte Daten pro Datenbank	Max. Betriebssysteme	32 GB	352 MB	Max. Betriebssysteme
Maximale Datenbankgröße	524 PB	524 PB	10 GB	524 PB
Produktionsnutzungsrechte	●	●	●	○
Unbegrenzte Virtualisierung, eine Software Assurance-Vergünstigung	●	○	○	○

/com/de-de/sql-server/sql-server-2017-editions#CP_StickyNav_1

Important limitations of the Express Version 2017

Like version 2016, but without full text search.

- Only one processor is used, but up to 4 processor cores.
- Maximum used memory per instance: 1.41 GB.
- A database may have a maximum size of 10 GB.
- The "SQL Server Agent" service is not included.
- Full-text indexing and searching is no longer included in the free edition.

Important limitations of the Express versions 2012, 2014 and 2016

- Only one processor is used, but up to 4 processor cores.
- Maximum used memory:
 - 1 GB in versions 2012 and 2014
 - 1.41 GB in version 2016
- A database may have a maximum size of 10 GB.
- The "SQL Server Agent" service, which controls automatic data backup, for example, is not included.
- Full-text indexing and searching is only available in the "Express with Advanced Services" edition.

Rule of thumb: If you have a choice, download the largest package from the Microsoft site to use all available features.

Important limitations of MS SQL Server 2008 R2 Express

- Only one processor or processor core is used.
- The Express edition uses a maximum of 1 GB of memory.
- A database may have a maximum size of 10 GB (in 2008 R1 only 4 GB).

here is another link, the discussion is specifically about the buffer pool

<https://dba.stackexchange.com/questions/199090/sql-server-express-instance-memory-vs-memory-limit>

SQL Server Express Features and Limitations

SQL Server Express is free to download and use, and it provides many of the features of the paid, full versions of Microsoft SQL Server (Enterprise, Standard and Web). However, it has technical restrictions that make it unsuitable for some large-scale deployments. Furthermore, the 2017 version of SQL Server Express includes features that were previously only in the Enterprise edition like In-Memory OLTP.

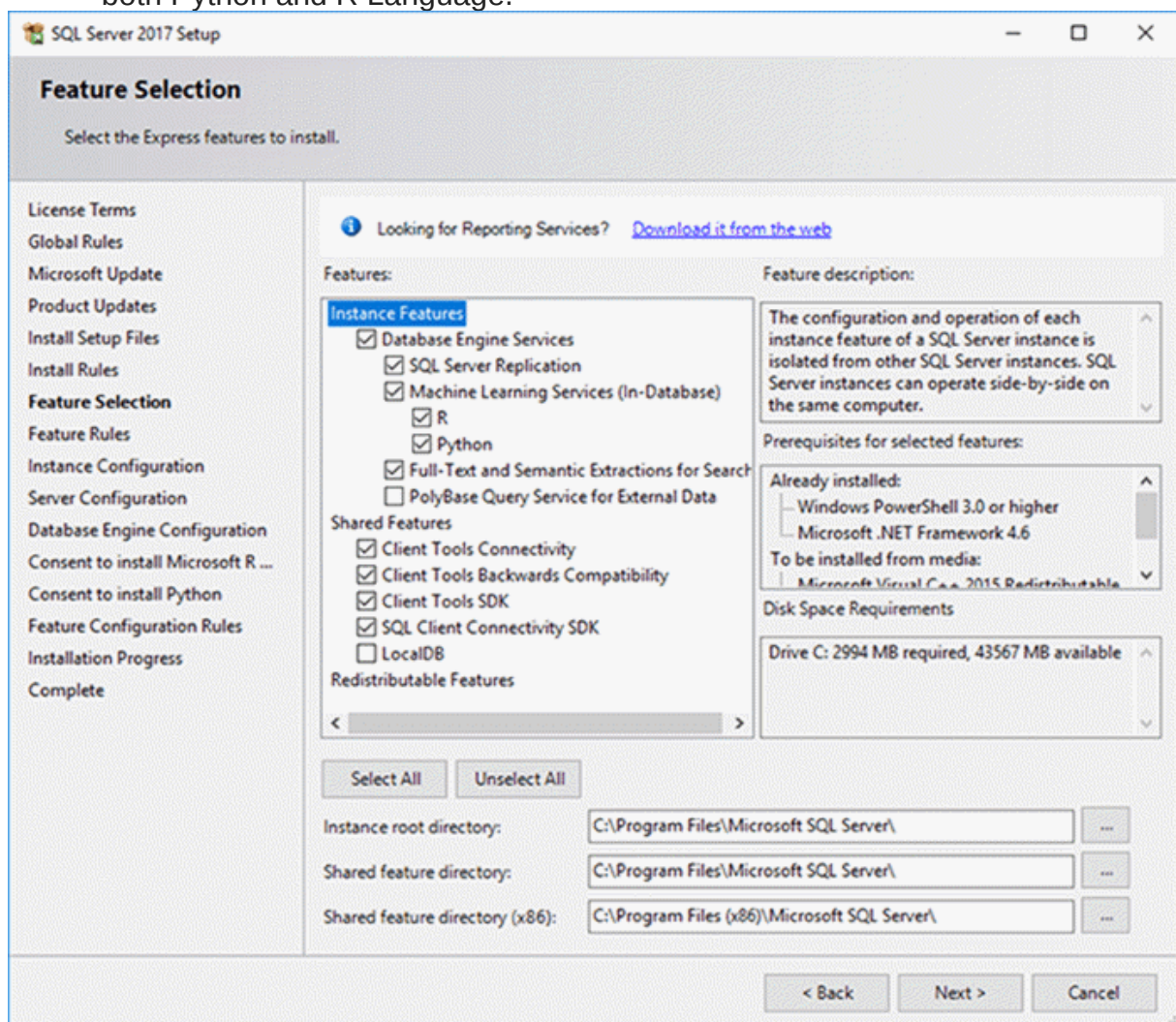
The difference between the full editions of SQL Server and the Express edition includes [artificial hardware limits](#) that prevent its usage on large scale applications with high concurrent access as well as some limitations in features.

The following list enumerates those differences.

- **Maximum database size of 10GB per database** is the same as in SQL Server 2016, SQL Server 2014, SQL Server 2012, and 2008 R2 Express (4GB for SQL Server 2008 Express and earlier, compared to 2GB in the former MSDE). **The limit applies for the database data files**, excluding the log files, but in some scenarios, users can access more data through the use of multiple interconnected databases. Just to remind you, the Standard and Enterprise editions allows databases up to 524 PB (Petabytes).
- No SQL Server Agent service to schedule processes (note: it was present in MSDE) .
- **Single physical CPU or four cores are allowed**
- **Maximum memory size per instance is 1410 MB. It will run on a system with a higher RAM amount, but it will only use 1410 MB per instance of SQL Server Express.**
- The Express with Advanced Services Edition has capped the maximum memory utilized per instance of Reporting Services to a limit of 4GB per instance of Reporting Services. The Standard and Web editions have a limit of 64 GB and the Enterprise edition is limited to the operating system maximum memory permitted.
- Maximum Columnstore segment cache per instance is 352 MB. According to Microsoft, columnstore indexes are the standard for storing and querying large data warehousing fact tables. It uses column-based data storage and query processing to achieve up to 10x query performance gains in your data warehouse over traditional row-oriented storage, and up to 10x data compression over the uncompressed data size. But since you only can use 352 MB for Columnstore indexes, this is not very practical to use. If you are developing an application that uses Columnstore indexes, you will probably want to use the SQL Server Developer edition which has no limit for columnstore indexes because its only limit is that this edition cannot be used in production.
- Maximum memory-optimized data per database is 352 MB. According to Microsoft, In-Memory OLTP helps improve performance of OLTP applications

through efficient, memory-optimized data access, native compilation of business logic, and lock- and latch free algorithms. The In-Memory OLTP feature includes memory-optimized tables and table types, as well as native compilation of Transact-SQL stored procedures for efficient access to these tables. As it happens with Columnstore Indexes, this feature is unlikely to be used.

- Other absent features in the SQL Server Express edition are Analysis Services and Integration Services.
- It does include the SQL Server Import and Export Wizard feature to allow data movement across different sources and destinations.
- The SQL Server Express edition allows us to use Reporting Services by downloading the installer from this link: <https://www.microsoft.com/en-us/download/details.aspx?id=55252>.
- Something that is not a feature per se is that we can use the same tools we use on Standard and Enterprise editions like SQL Server Management Studio (SSMS), SQL Server Profiler, Import Export Wizard, sqlcmd and Extended Events Profiler. You can download SQL Server Management Studio from this link: <https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms>.
- Also, as you can see on the screen capture below of the SQL Server Express edition installer, we can install Machine Learning Services (In-Database) with both Python and R Language.



Reasons You Would Use SQL Server Express Edition

By now, after reading the differences of the Express edition against the Standard and Enterprise editions, you may be asking yourself about the motives that will make you choose to use the Express edition of SQL Server instead of some other solution.

- **It's Free.** SQL Server Express is free for production usage. In opposition to the SQL Server Developer edition which is also free to download and use but cannot be deployed in production environments.
- **Fully supported by Microsoft including patches and updates.**
- **It's built on SQL Server.** It may seem obvious, but what I want to state is that any project or development done on SQL Server Express is 100% compatible and ready to be deployed on any of the paid editions of SQL Server.
- **Backup and Restore databases.** You have the ability to backup and restore databases the same way as with any of the paid editions. Furthermore, you can restore backups taken from Standard or Enterprise editions, but it's limited to those databases that don't use features only available on those editions. For example, you won't be able to restore a 100GB database to an Express edition.
- **It's scalable.** Software creators can sell their applications to different sized companies by not forcing their customers to pay for the Standard or Enterprise edition meanwhile they still have the chance to do so in the future.
- **Data security.** With SQL Server Express you can take advantage of Row-Level Security, Always Encrypted, basic and fine-grained auditing and Dynamic Data Masking features.
- **You can use the same tools** for monitoring that you use on Enterprise and Standard editions.
- **Includes features you need.** SQL Server Express 2017 includes the security features I previously mentioned and also In-Memory OLTP and Columnstore Indexes, Table and index partitioning, Data compression, Stretch Database to Azure amongst others that make this product worth to be considered. You can use Database Snapshots and Database Recovery Advisor for high availability and disaster recovery. You can also use the Express edition as a witness on a Database Mirroring configuration and save money by not using a paid edition.
- **You don't have a limit for concurrent connections.** The only limit you may get is OS related. For example, if you are using a home user version of Windows you will be limited by the number of connections allowed by the OS. But if you install SQL Server Express on a Server edition of Windows you won't be limited on concurrent connections.
- **You can easily upgrade.** You have the chance to upgrade to Standard or Enterprise editions very easily.