

How SQL Virtual Database works

SQL Virtual Database is driven by a unique, patent-pending recovery technology that makes backup files behave like regular physical databases. This technology allows you to create virtual databases by directly attaching backup files to SQL Server without requiring a restore operation.

Each virtual database is hosted by the SQL Server instance you specify. All objects and data in the virtual databases are accessible to SQL Server jobs and stored procedures, T-SQL scripts, and other third-party applications.

The SQL VDB Engine, which consists of the Filter Driver and Filter Service, manages the virtual database and services the SQL Server I/O requests to the virtual data files. As the SQL VDB Engine attaches your selected backup files and creates the virtual database, it consolidates all the transactions and presents them to SQL Server for recovery. During this process, SQL Virtual Database "maps" the data from the backup files. *If the data is already "mapped,"* such as through SQL Safe or the [Map Generation CLI action](#), then SQL Virtual Database proceeds to the virtual database creation. You can create a virtual database by attaching specific data sets from multiple full, differential, and transaction log backups.

You can then use the SQL VDB Console, or any other third-party tool, to perform queries against specific virtual databases or simply check the status of your virtual databases. For more information, see our instructions on [how to use your virtual database](#) as well as [tips and tricks](#).

The product features, such as the virtual database creation, are also available through the SQL VDB CLI. For more information, see the [product component](#) descriptions.

How SQL VDB works with SQL Safe Backup

SQL Virtual Database seamlessly converts SQL Safe Backup files into virtual databases. You can use SQL Virtual Database with any backup file generated by SQL Safe 5.0 or later. For more information, see the [product requirements](#).

When you attach a backup file previously created by SQL Safe 5.0, the SQL VDB Engine performs the same steps as it does with the native SQL Server backup. To optimize performance for large databases, use the [Map Generation CLI action](#) to generate the required metadata before attaching the backup files.

With SQL Safe 6.0 or later, you can configure your backup operation to automatically generate the metadata. By default, this option is enabled when you perform a new manual backup or define a new backup policy. For more information, see the [SQL Safe online Help](#).

Virtual data files created by SQL VDB

For each virtual database you create, several files are also created to support the new virtual database. These virtual data files are:

File	Description	Location	Can you move it?	When is it deleted?
*.xbm *.xcm *.xdm *.xtm	Files that the SQ VDB Driver creates to map the data in the selected backup files.	In the same folder where you store your backup files.	No. Moving these files will cause errors when you attempt to access the virtual database.	Never ... After you have retrieved the data you need from the virtual database, you can use the groom feature to delete unused data files, manually delete these files, or schedule a job to periodically groom old files.
*.lcf *.mcf *.ncf	Files that the SQL VDB Service creates when reading changed pages from the transaction log for the selected backup files.	In the VDB/Sparse folder under the Program Files directory on the client computer.	No, but you can specify a new location ... Moving these files when the virtual database is attached will cause errors when you attempt to access its data. To choose a different location for these files, delete your virtual databases, and then specify a new directory path . When you create the next virtual database, the SQL VDB Engine will use the new path.	When the virtual database is removed (dropped) from the SQL Server instance.
*.lxf *.mxf *.nxf	Virtualized versions of the .lcf and .mcf files associated with the selected backup set.	None ... These files are placeholders for SQL Server.	No, these files do not exist on your disk.	When the virtual database is removed (dropped) from the SQL Server instance.
*.vdb	An XML file that contains the configuration information for the virtual database.	In the Repository folder under the Program Files directory on the client computer.	No. Moving these files will cause errors when you attempt to access the virtual database.	When the virtual database is removed (dropped) from the SQL Server instance.

Disk space allocation

The amount of disk space consumed by the virtual data files depends on the size and content of your backup files. For more information, see the [recommended disk space allocations](#).



The size for these files may display incorrectly in tools such as Management Studio. To see the correct size, use Windows Explorer to navigate to the file and then view the file properties.

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