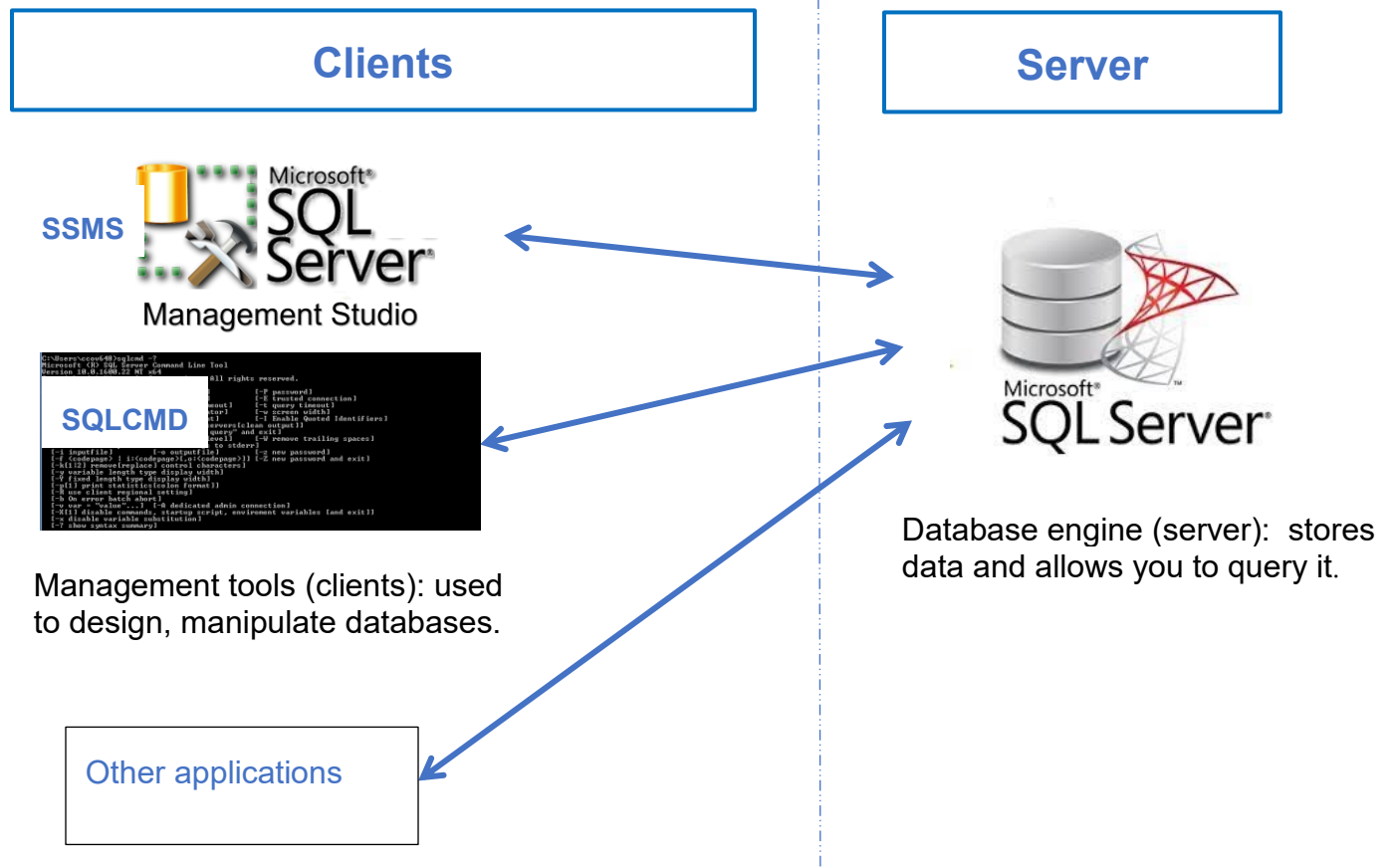
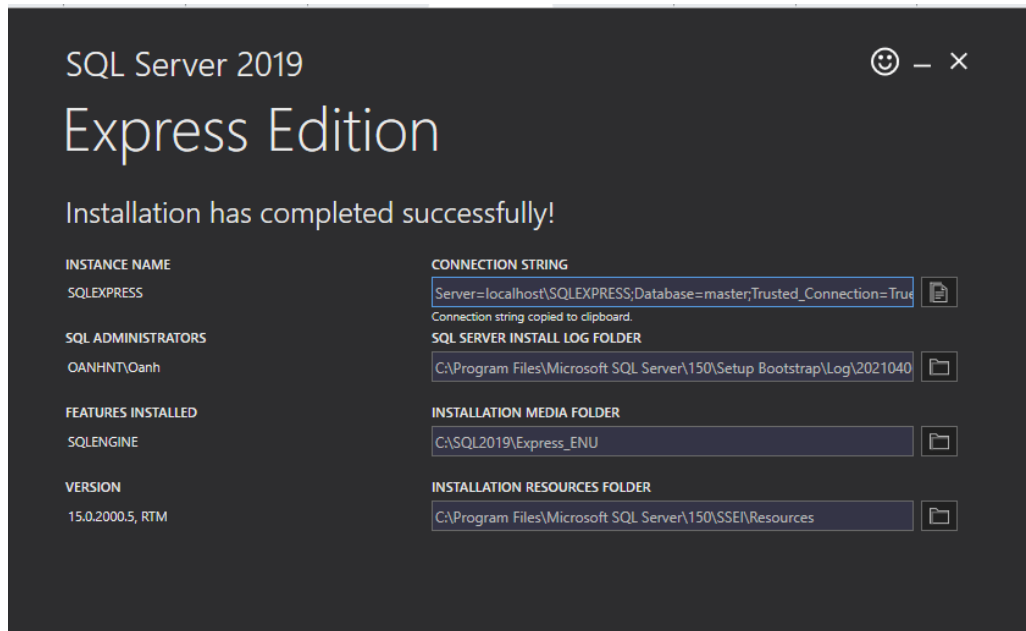


Environment



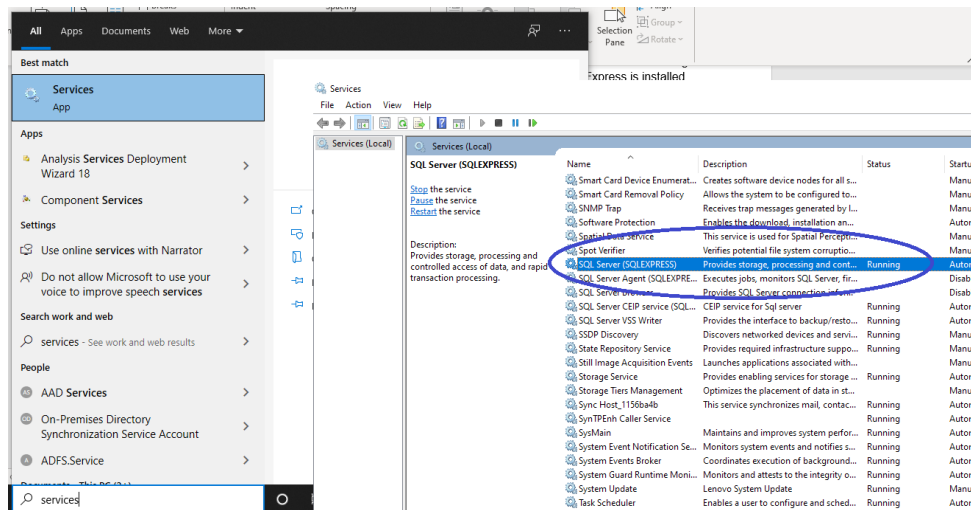
Installation:

- Step-by-step guide to install **SQL Server 2019 Express** and **SSMS**:
<https://www.e2enetworks.com/how-to-install-ms-sql-server-2019-express-edition-on-windows-server-2016-19/>



- SQL Server: **Database engine (server)** that stores data and allows you to query it.
 - o **SQL Server Express**: a free edition of SQL Server, ideal for development and production for desktop, web, and small server applications
 - o Latest version: 2019. However, we can use previous versions according to the hardware. On lab's computer, SQL Server 2012 Express is installed.
 - o Link to download: <https://www.microsoft.com/en-us/sql-server/sql-server-downloads>

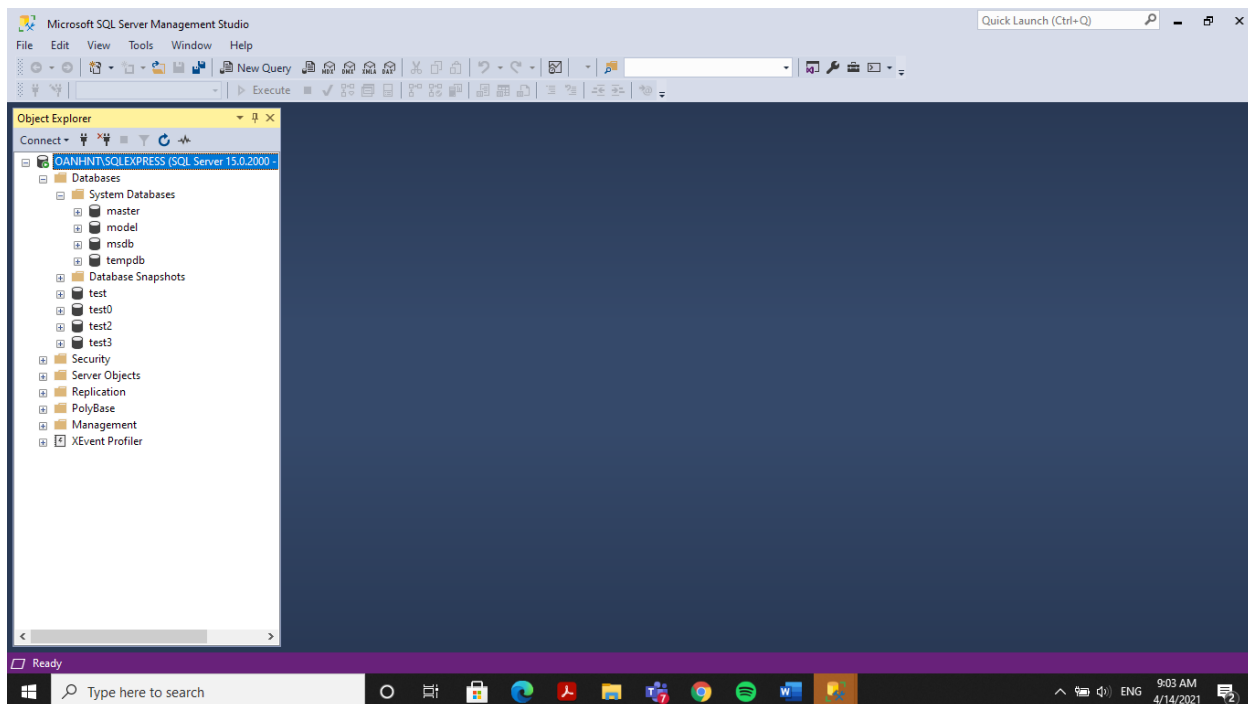
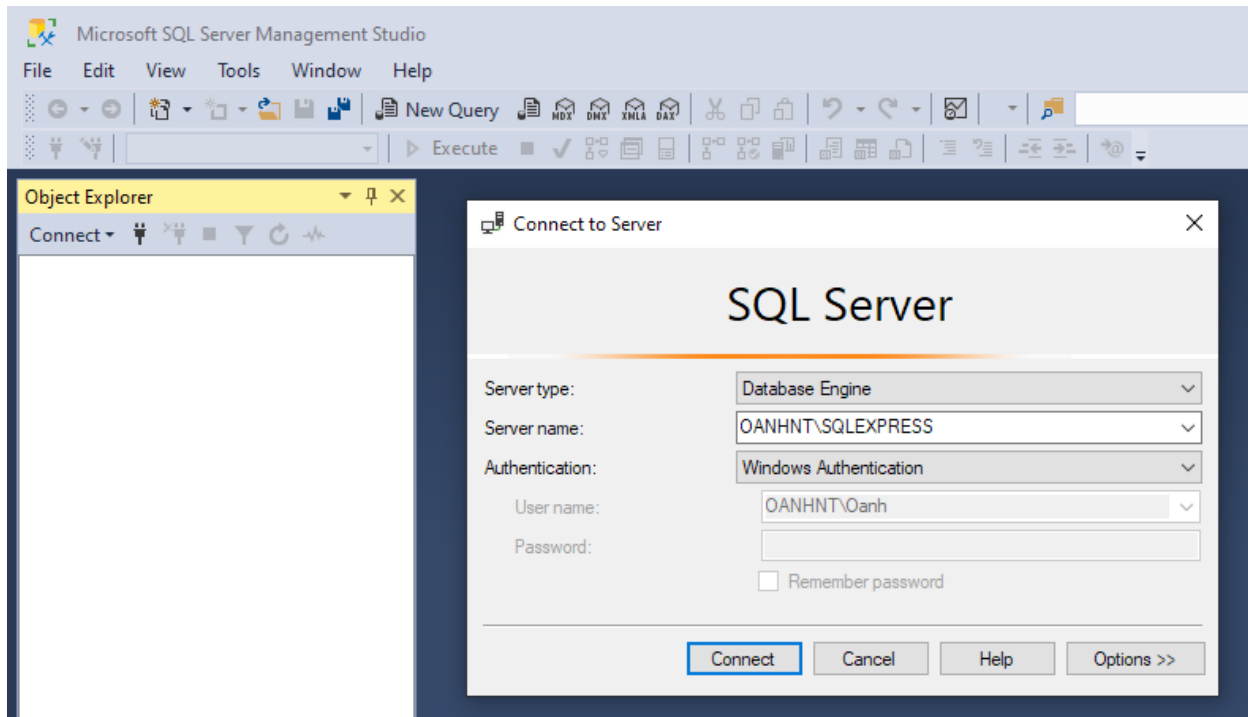
- After installing, the server service is automatically started



- **SSMS** (SQL Server Management Studio) (**client**): GUI Administration Tool for working against the SQL Server engine
 - Use SSMS to query, design, and manage your databases and data warehouses, wherever they are - on your local computer, or in the cloud.
 - SSMS runs on Windows (AMD or Intel) only.
 - Download and install: <https://docs.microsoft.com/en-us/sql/ssms/download-sql-server-management-studio-ssms?view=sql-server-ver15>
 - Usage guide : <https://docs.microsoft.com/en-us/sql/ssms/quickstarts/ssms-connect-query-sql-server?view=sql-server-ver15>
- **Sqlcmd** Utility (**client**): command line tools (*optional*)
 - they are being released with the installer package for SQL Server 2019 (15.x).
 - Link for downloading and usage: <https://docs.microsoft.com/en-us/sql/tools/sqlcmd-utility?view=sql-server-ver15>
 - Other command-line tools: bcp, mssql-cli, sqlpackage, ... [SQL tools overview - SQL Server | Microsoft Docs](#)

Connect to database engine using SSMS

- Connect MS SQL 2019 Express Database via Windows Authentication



SQL Server mainly contains four System Databases (master,model,msdb,tempdb). Each of them is used by SQL Server for Separate purposes.

Master Database (master) contains information about SQL server configuration. Without Master database, server can't be started. This will

- store the metadata information about all other objects(Databases,Stored Procedure,Tables,Views,etc.) which is Created in the SQL Server .
- contain login information of users.

If the master database gets corrupted and is not recoverable from the backup, then a user has to again rebuild the master database. Therefore, it is always recommended to maintain a current backup of the master database. As everything crucial to SQL server is stored in the master database, it cannot be deleted as it is the heart of SQL SERVER.

The **model database** (model) sets a template for every database that was newly created.

- When we create a new database, the data present in model database are moved to new database to create its default objects which include tables, stored procedures, etc.

The **msdb database** is used mainly by the SQL server Management Studio, SQL Server Agent to store system activities like sql server jobs, mail, service broker, maintenance plans, user and system database backup history, Replication information, log shipping .We need to take a backup of this database for the proper function of SQL Server Agent Service.

The tempDB: from the name of the database itself, we can identify the purpose of this database. It can be accessed by all the users in the SQL Server Instance.

The tempdb is **a temporary location for storing temporary tables** (Global and Local) and **temporary stored procedure** that hold intermediate results during the sorting or query processing and cursors.

If more temporary objects are created and used storage of tempDB then performance of SQL Server will affect.So recommended to move the temdb to the location where sufficient amount of space is there.

Some command for working in SQLCMD:

- Show the current database (connected database name)
`select DB_NAME() AS [CURRENT_DATABASE]; GO`

- Lists of all databases:

```
select db_name(), database_id, source_database_id, physical_database_name  
from sys.databases;
```

```
1> select db_name(), database_id, source_database_id, physical_database_name from sys.databases;  
2> go
```

	database_id	source_database_id	physical_database_name
master	1	NULL	master
master	2	NULL	tempdb
master	3	NULL	model
master	4	NULL	msdb

(4 rows affected)

- Show the description of a table:

```
sp_help 'TableName';  
GO
```

- Create a new database:

```
CREATE DATABASE test;  
GO
```

- Connect to a database:

```
USE test;  
GO
```