

INTRODUCTION TO .NET FRAMEWORK

- The .NET Framework is a software development framework developed by Microsoft that provides a runtime environment and a set of libraries and tools for building and running applications on Windows operating systems.
- .NET Framework includes **two main components - Common Language Runtime and .NET Framework Class Library.**
- **The CLR is responsible for managing the execution of code written in any of the supported languages, while class library provides a large set of pre-built functions and classes** that can be used to create a wide range of applications.
- **One of the key advantages of the .NET Framework is its support for a variety of programming languages.** This means that developers can choose the language that best fits their needs and expertise, **while still being able to use the same set of libraries and tools provided by the framework.**
- **Another advantage of the .NET Framework is its support for a variety of application types.** The framework includes libraries and tools for creating **desktop, web, mobile, and gaming applications**, which makes it a versatile choice for developers working on a wide range of projects.
- The .NET Framework is also designed to integrate with other Microsoft technologies, such as Microsoft SQL Server, Microsoft SharePoint, and Microsoft Office, which can make it easier to build applications that work seamlessly with other Microsoft products.

.NET is a software framework that is designed and developed by Microsoft. **The first version of the .Net framework was 1.0 which came in the year 2002.**

It is used to develop Form-based applications, Web-based applications, and Web services.

MAIN COMPONENTS OF .NET FRAMEWORK

- **COMMON LANGUAGE RUNTIME(CLR):** CLR is the basic and Virtual Machine component of the .NET Framework.
- It is the run-time environment in the .NET Framework that runs the codes and helps in making the development process easier by providing various services such as remoting, thread management, type safety, memory management, robustness, etc.
- Basically, it is responsible for managing the execution of .NET programs regardless of any .NET programming language.
- It also helps in the management of code, as code that targets the runtime is known as Managed Code, and code that doesn't target to runtime is known as Unmanaged code.
- **FRAMEWORK CLASS LIBRARY(FCL):** It is the collection of reusable, object-oriented class libraries and methods, etc that can be integrated with CLR. Also called the Assemblies.
- The FCL is a super set of the BCL and includes additional libraries for developing various types of applications, such as desktop, web, and mobile apps.
- It is just like the header files in C/C++ and packages in java. Installing the .NET framework basically is the installation of CLR and FCL into the system.
- **Key Features - Windows Forms:** For creating desktop applications with graphical user interfaces (GUIs).
- **Key Features - ASP.NET:** For building dynamic web applications and services.
- **Key Features - ADO.NET:** For accessing and managing data from databases.
- **Key Features - WPF (Windows Presentation Foundation):** For building rich, visually appealing user interfaces.

- **Key Features - WCF (Windows Communication Foundation):** For building distributed systems and services.
- **BASE CLASS LIBRARY (BCL) :** The BCL is a collection of reusable classes, interfaces, and value types that provide fundamental functionalities for .NET applications.
- **Key Features:** System.IO, System.Net, System.Data, System.Collections, System.Linq, System.Text.
- **COMMON TYPE SYSTEM(CTS) :** The CTS defines how data types are declared, used, and managed in the runtime. It ensures that objects written in different .NET-supported languages can interact seamlessly.
- **Key Features: Data Type Compatibility:** Ensures consistency across languages.