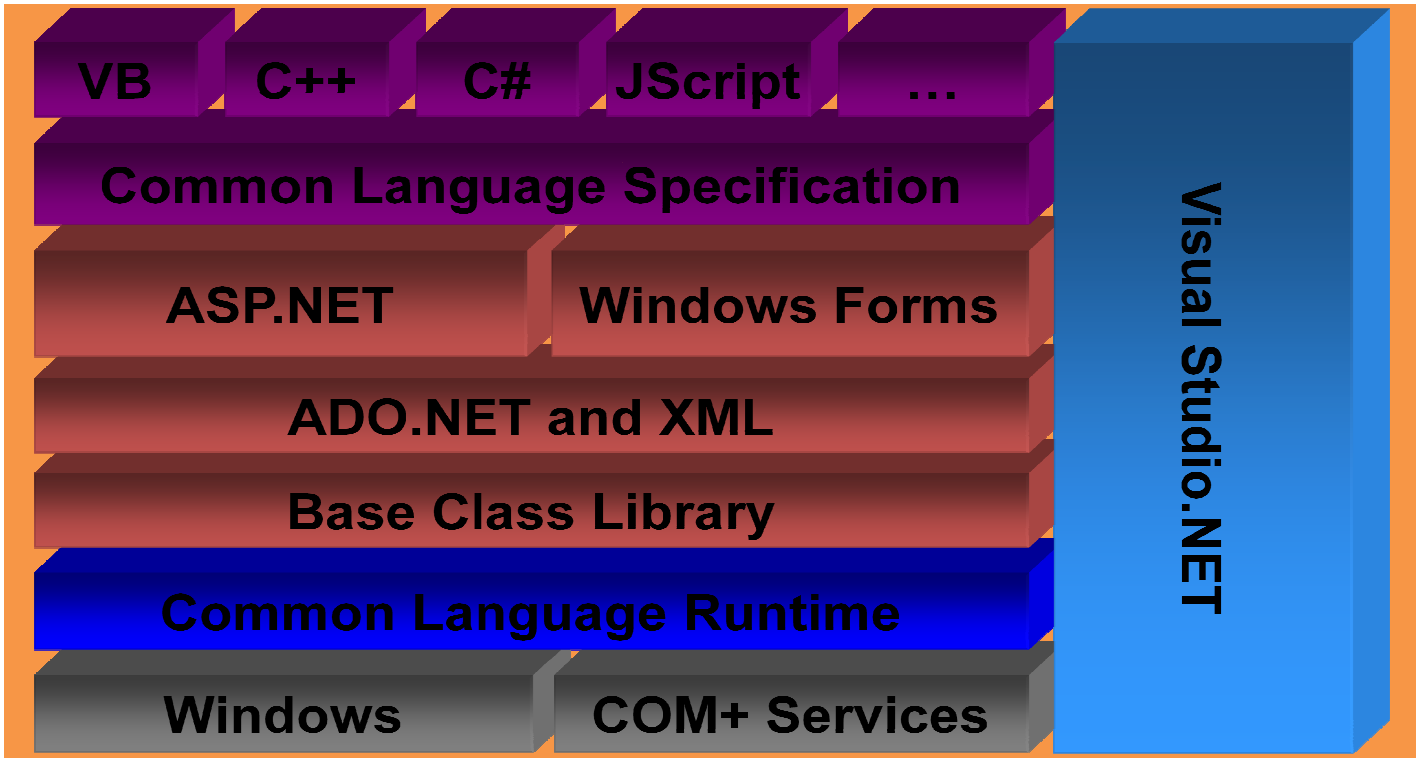
Advanced Programming Language (630501)
Fall 2011/2012 – Lectures Notes # 11-12

# Programming in C#: .NET Architecture

## Outline of the Lecture

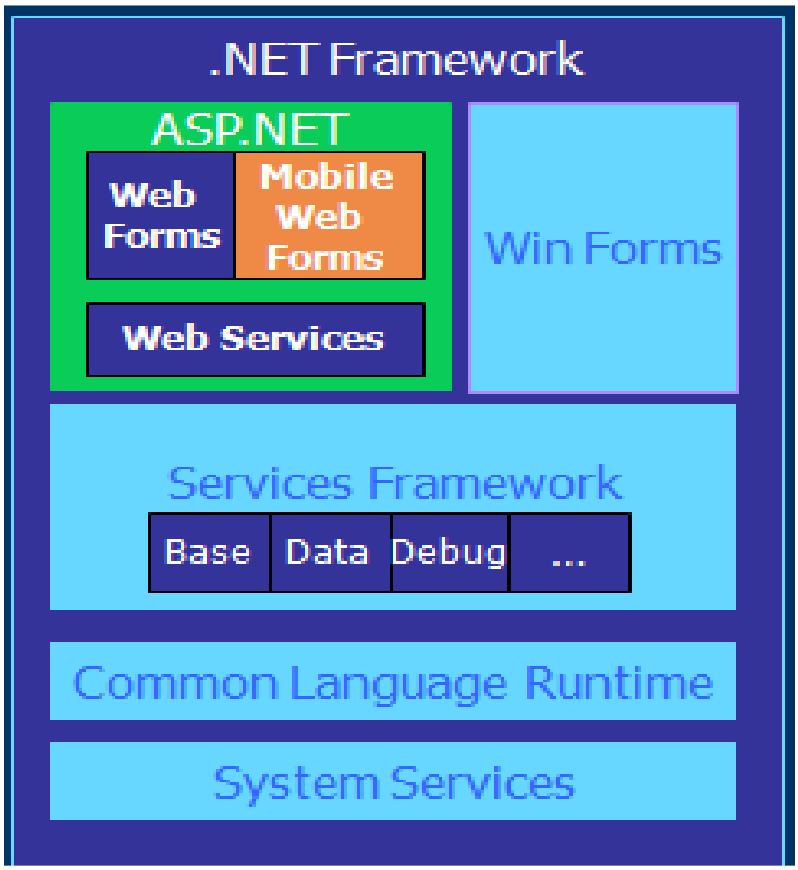
- .NET Architecture
- Compilation and Execution
- The .NET Framework Library
- Base Framework

## .NET Architecture



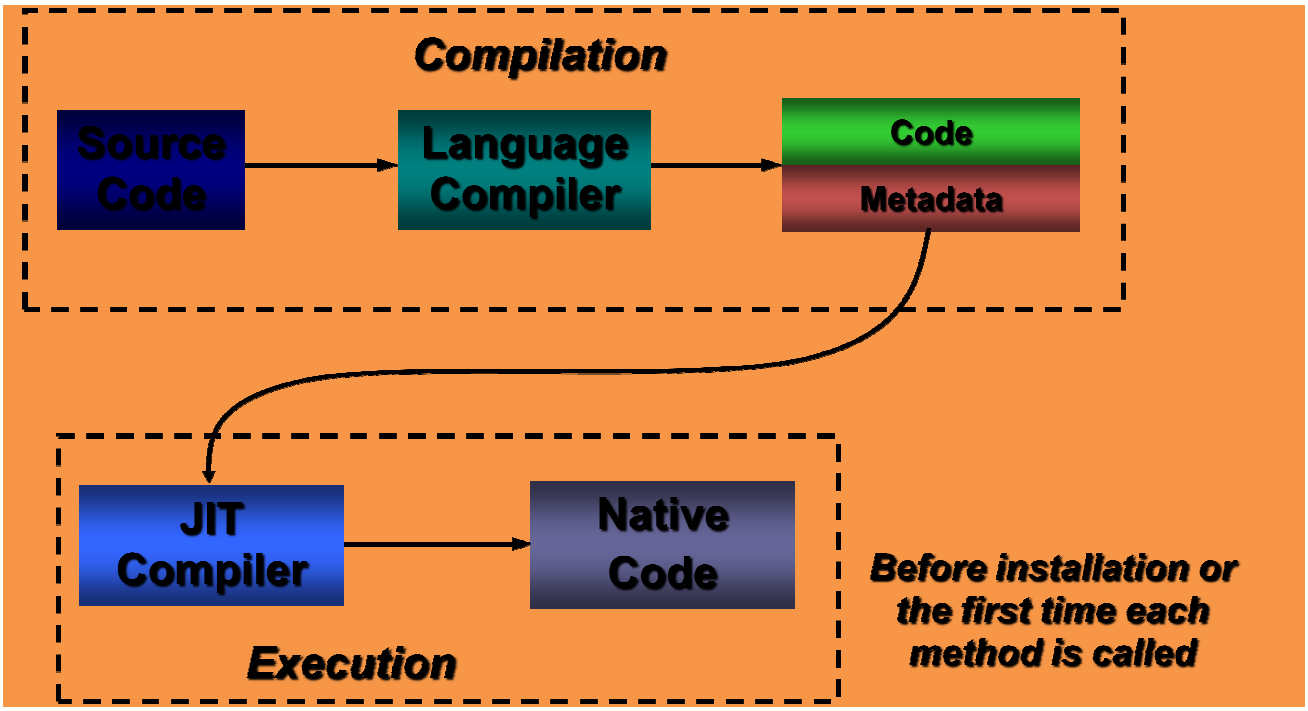

- **The architecture** of the .NET platform, which is made up of
  - *The .NET Framework*
  - *The Common Language Specifications (CLS)*
  - *The Common Language Runtime (CLR),*
  - *Microsoft Intermediate Language (MSIL),*
  - *The Base Class Library (BCL).*

- **Common Language Specifications** (***CLS***): The minimum requirements that a .NET language must support. In order to create components that are accessible from every .NET implementation, the code must follow the CLS.
- **.NET Framework**: The platform for building and deploying .NET applications. These applications include:
  - *Web services*
  - *Windows forms*
  - *Web forms*
  - *Console applications*
  - *Mobile applications and so forth.*



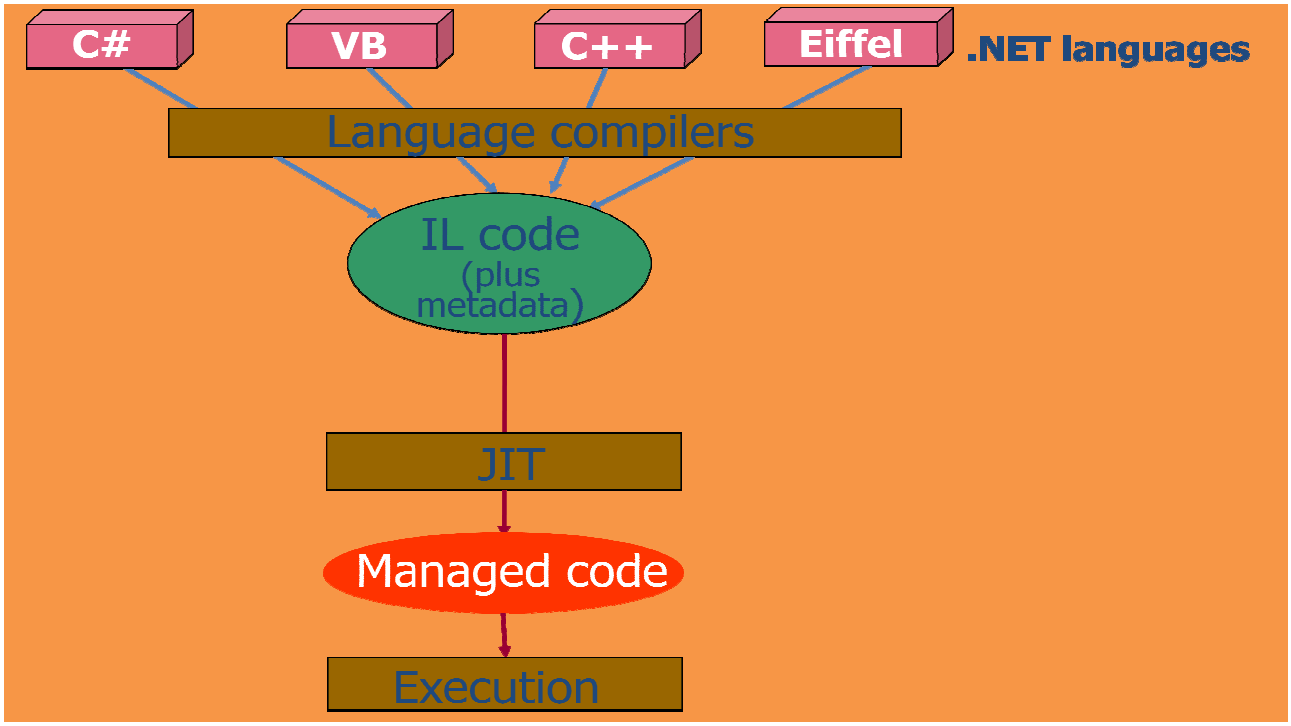

- **Common Type System** (***CTS***) defines a set of rules that all .NET language compilers must follow. These rules specify information about reference and value types.
- **.NET Framework class library** (***FCL***) is a collection of prebuilt classes that can be used by any application. These classes provide the developer with reusable components.

## Compilation and Execution

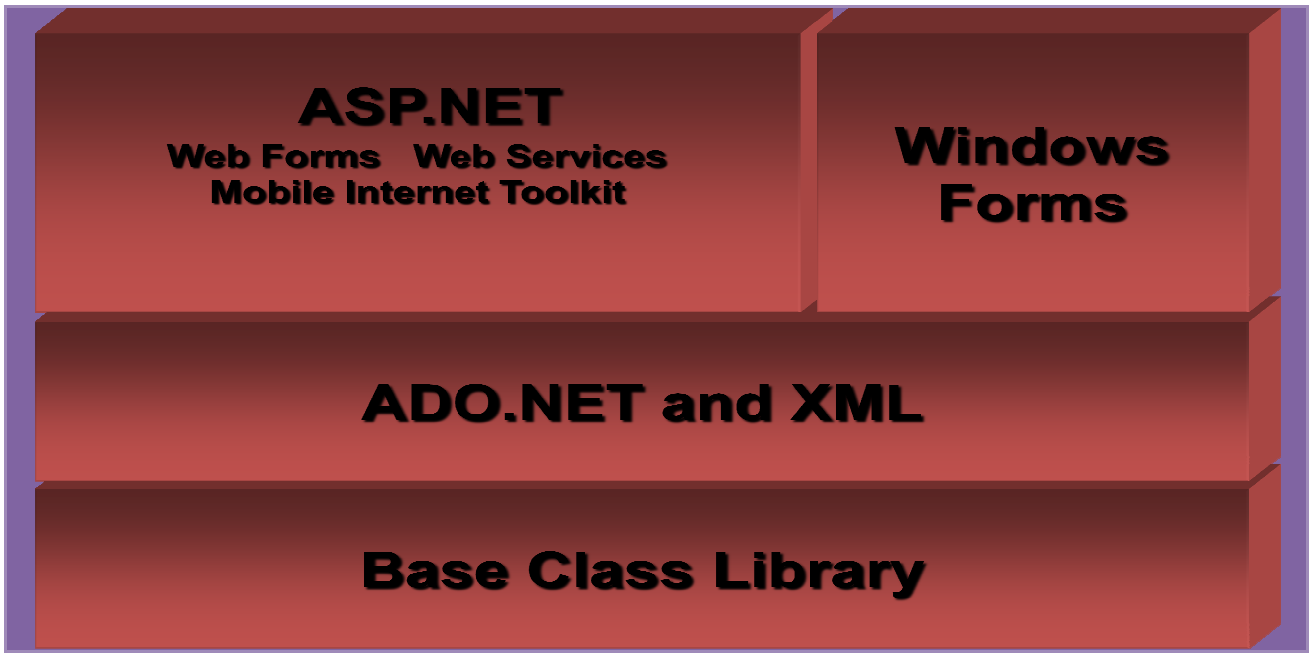



- **Common Language Runtime** (***CLR***): The runtime environment that supplies services for .NET code, such as object lifetime, debugging, and code-access security.
  - **Microsoft Intermediate Language** (***MSIL***): The language created when a program is compiled using the *.NET Framework*.
  - **Metadata Information** that describes the underlying data. It is data about data. Metadata can supply information to the runtime about security, binding, debugging, and the like.
  - **just-in-time compilation** (***JIT***): The process by which *Microsoft Intermediate Language* is converted into *machine code* when the code is run.
  - **Managed code**: Code that supplies *metadata* that is read by the runtime and provides information about memory management, code access, security, and so forth. Any code that is created using Microsoft Intermediate Language is executed as managed code.
  - **Native code:** The code that is created when MSIL code is compiled to be machine specific.

Execution scheme under .NET



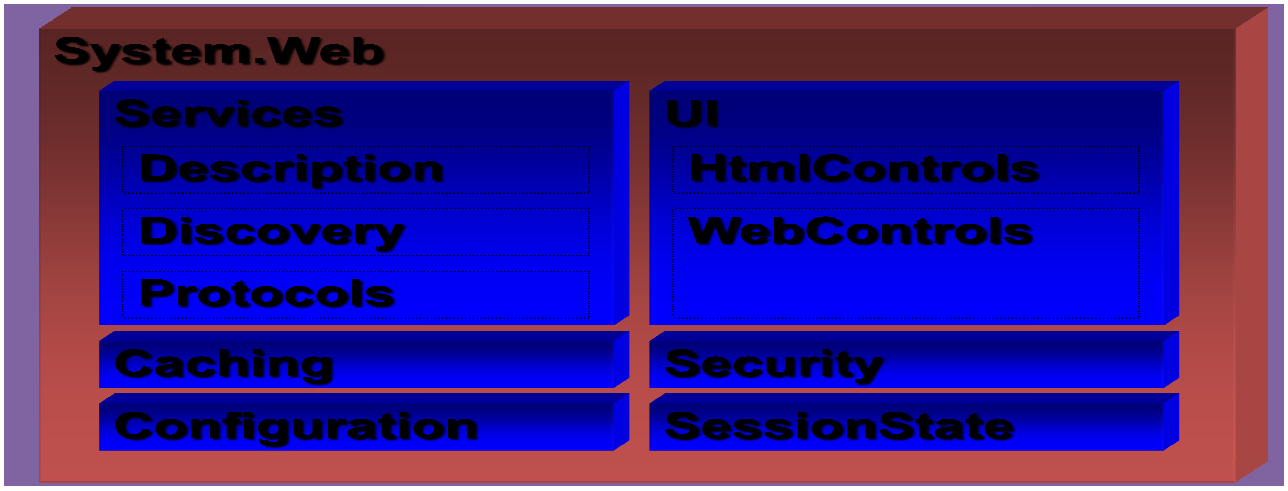

## The .NET Framework Library




## Base Framework

## Data and XML


## ASP.NET




## Windows Forms