



Object Oriented Frameworks

M.MADADYAR

[HTTP://WWW.MADADYAR.IR](http://www.madadyar.ir)



.NET – What Is It?

- ▶ Software platform.

- ▶ Language neutral.

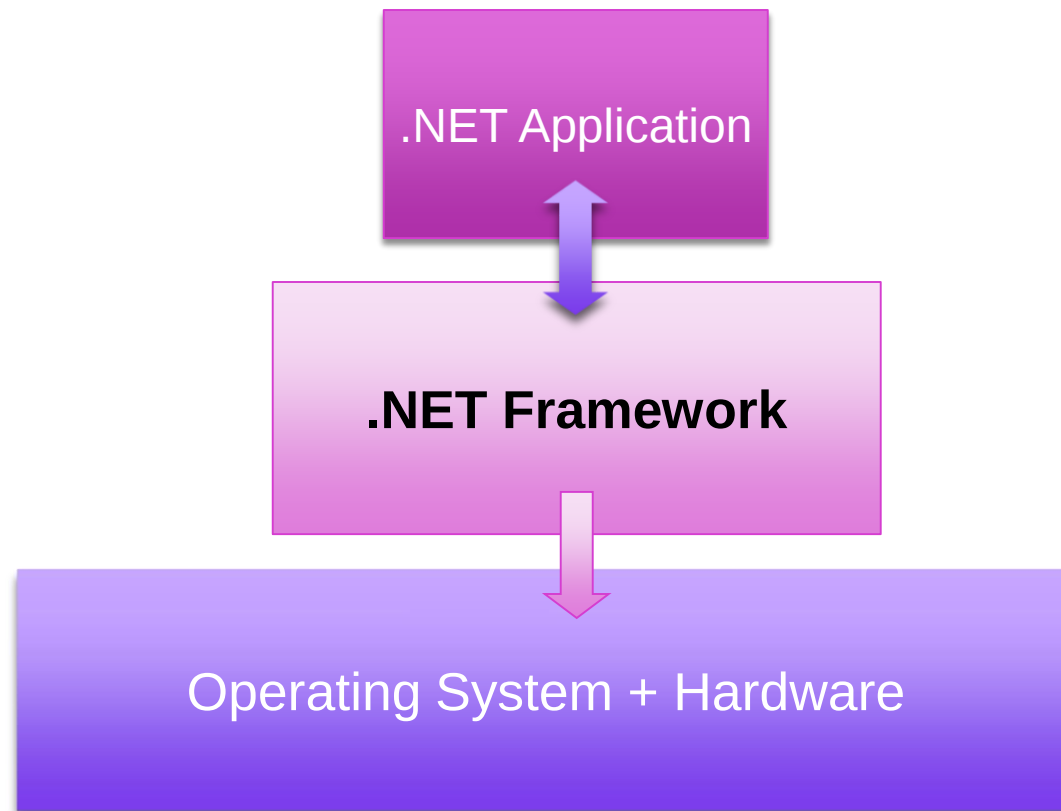
- ▶ In other words:

.NET is not a language (**Runtime and a library** for writing and executing written programs in any compliant language).

What Is .NET

- ▶ **.Net** is a framework for developing *web-based* and *windows-based* applications within the Microsoft environment.
- ▶ The framework offers a fundamental shift in Microsoft strategy:
 - ▶ it moves application development from client-centric to server-centric.

.NET



The .NET Framework Components

VB

C++

C#

J#

...

Common Language Specification

Web Forms
(ASP.NET)

Win Forms

ADO .NET - Data and XML

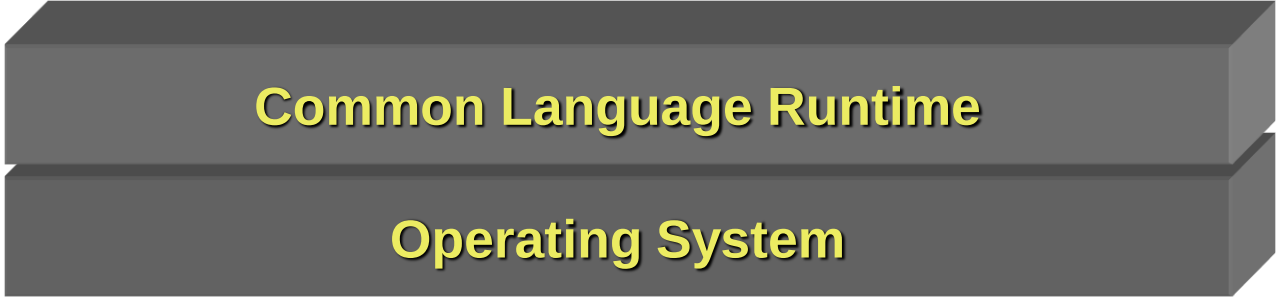
Base Class Library

Common Language Runtime

Visual Studio.NET

Common Language Runtime

- ▶ CLR manages code execution at runtime.
- ▶ Memory management, thread management, etc.

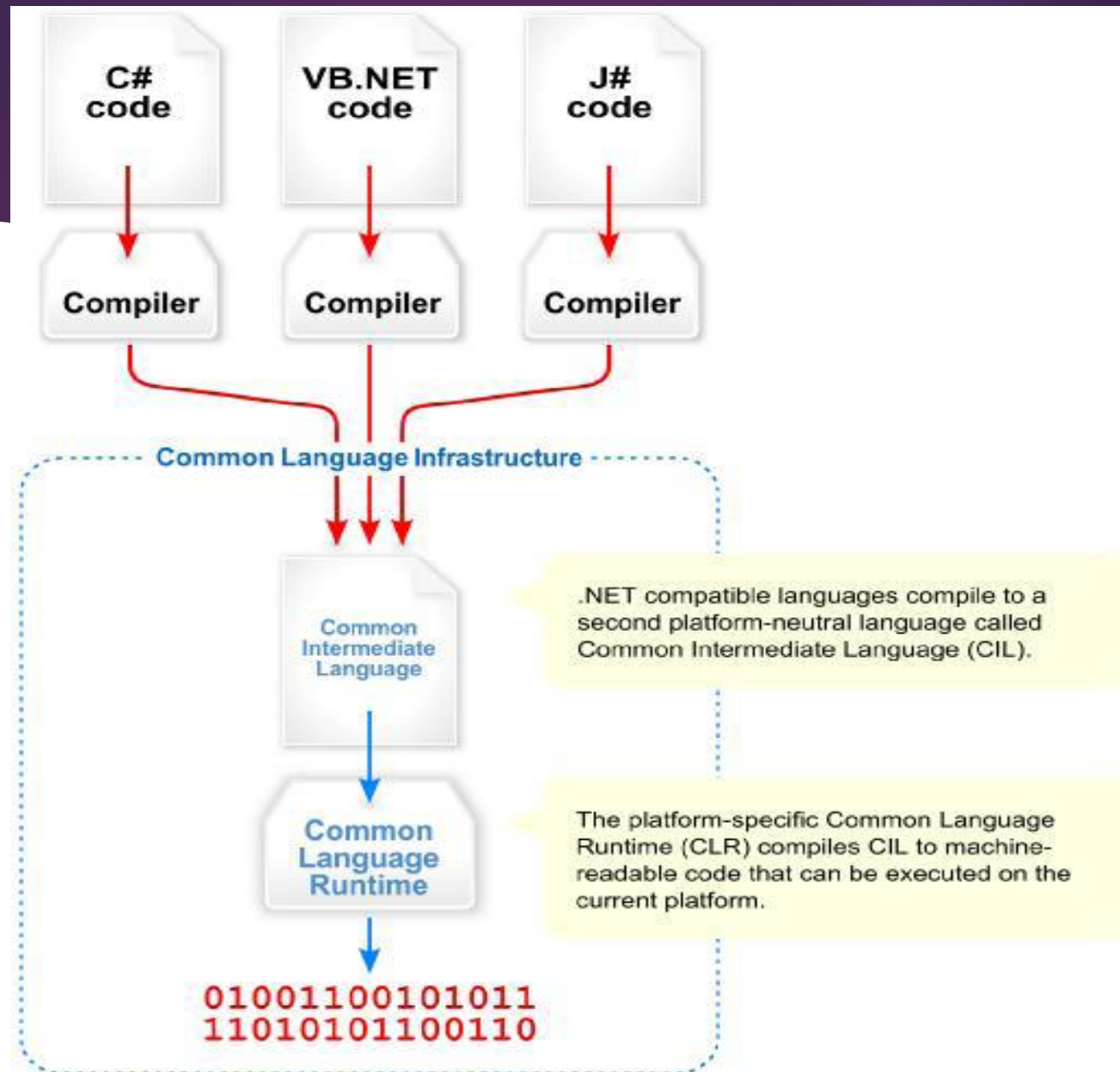


Common Language Runtime

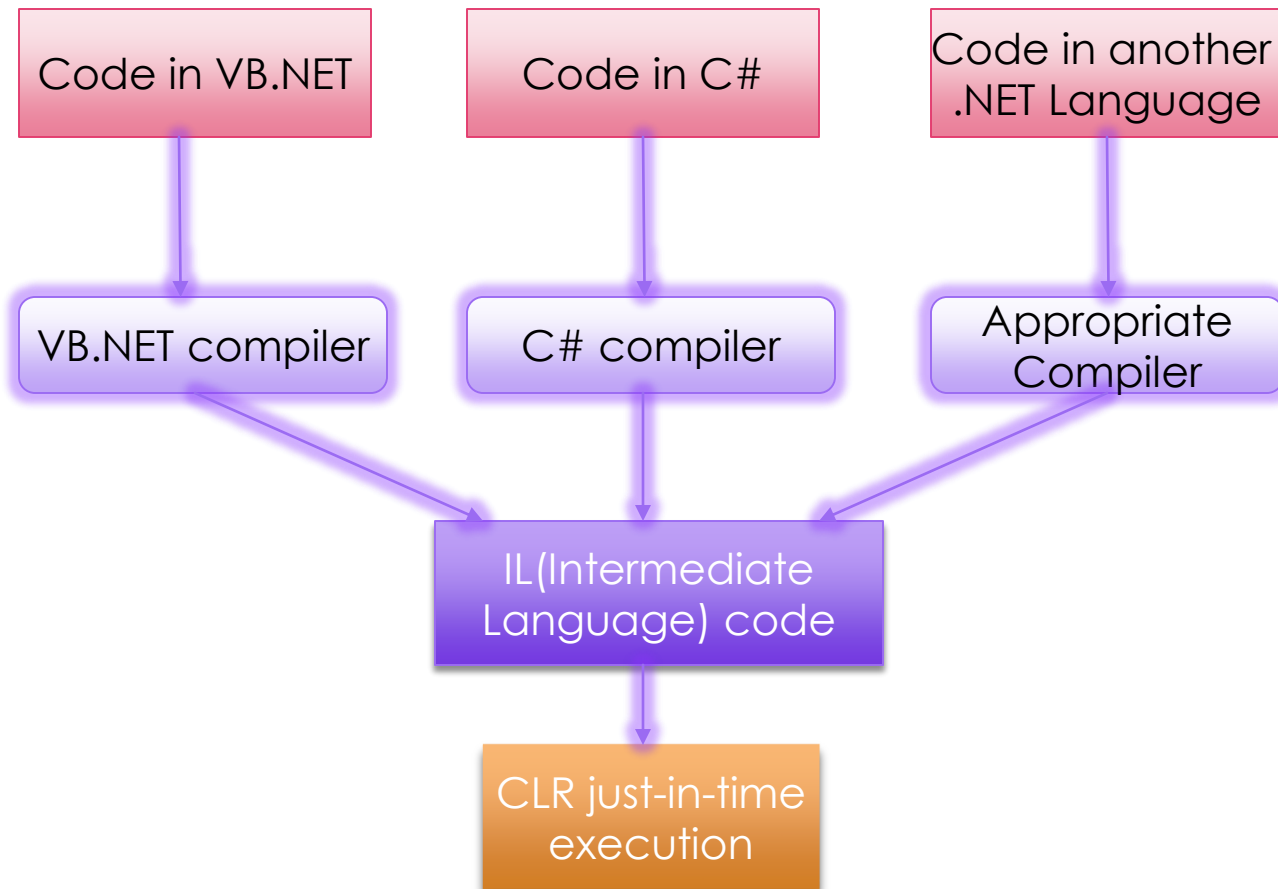
Operating System

Common Language Runtime (CLR)

- ▶ CLR works like a virtual machine in executing all languages.
- ▶ All .NET languages must obey the rules and standards imposed by CLR. Examples:
 - ▶ Object declaration, creation and use.
 - ▶ Data types, language libraries.
 - ▶ Error and exception handling.

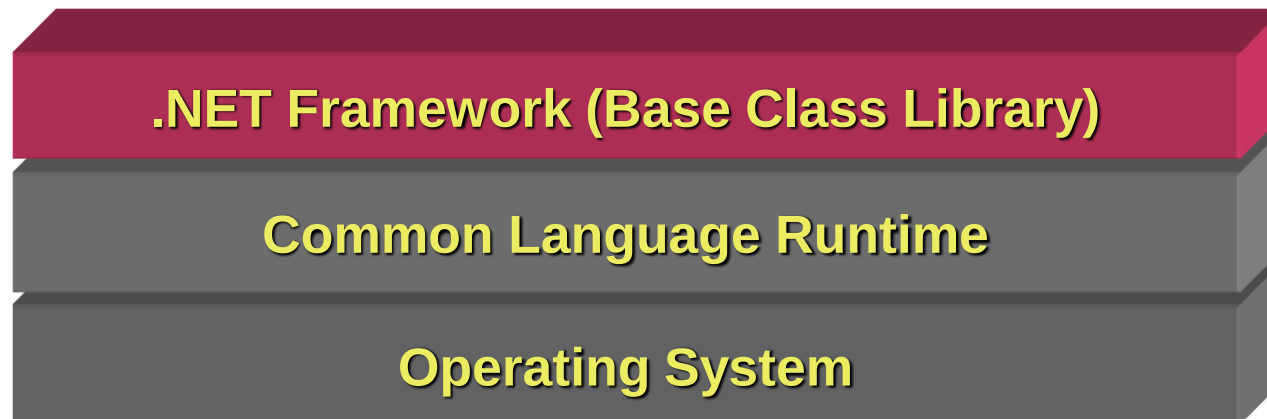


Compilation in .NET



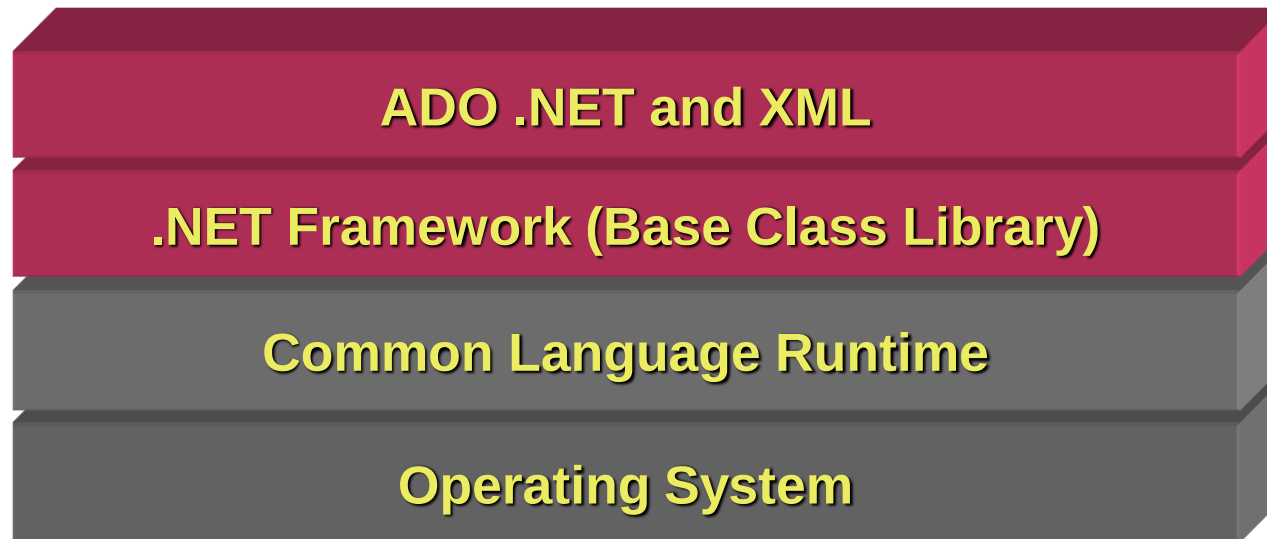
Base Class Library

- ▶ Object-oriented collection of reusable types.
- ▶ Collections, I/O, Strings, ...



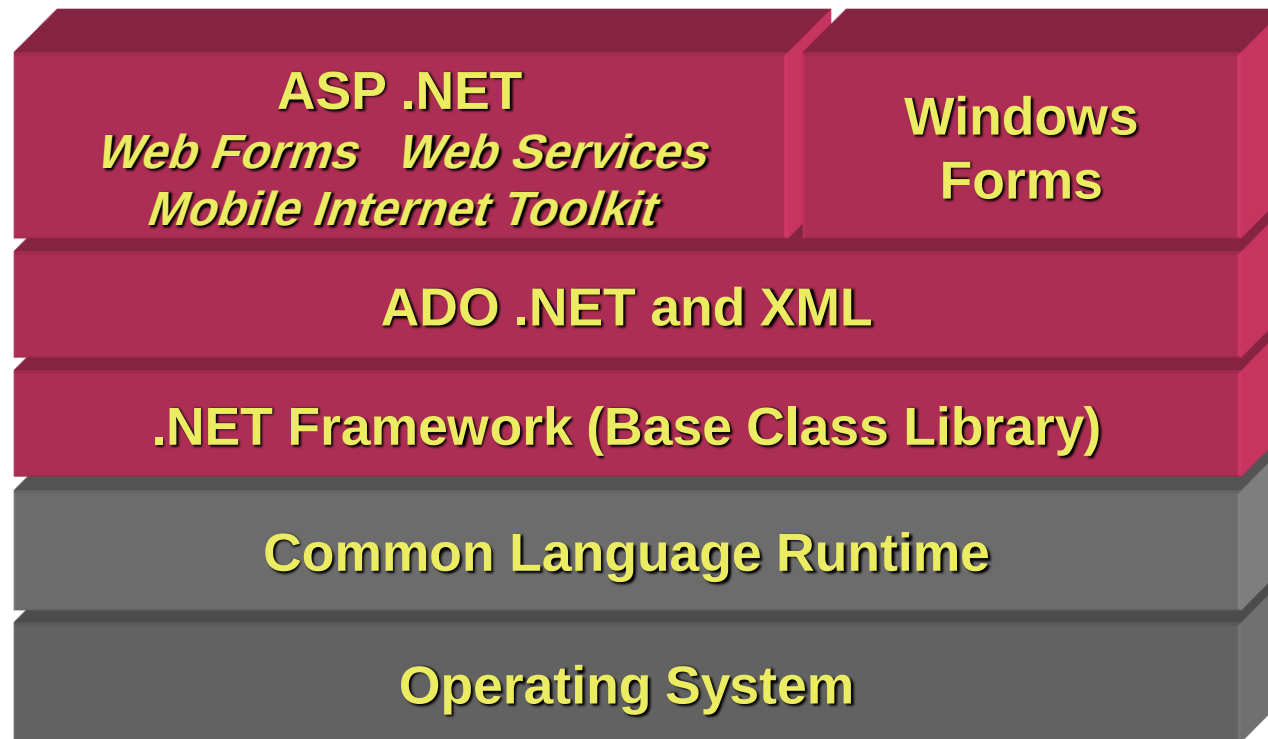
Data Access Layer

- ▶ Access relational databases.
- ▶ Work With Any Databases like SQL Server,MySQL,Oracle.
- ▶ Work with XML.



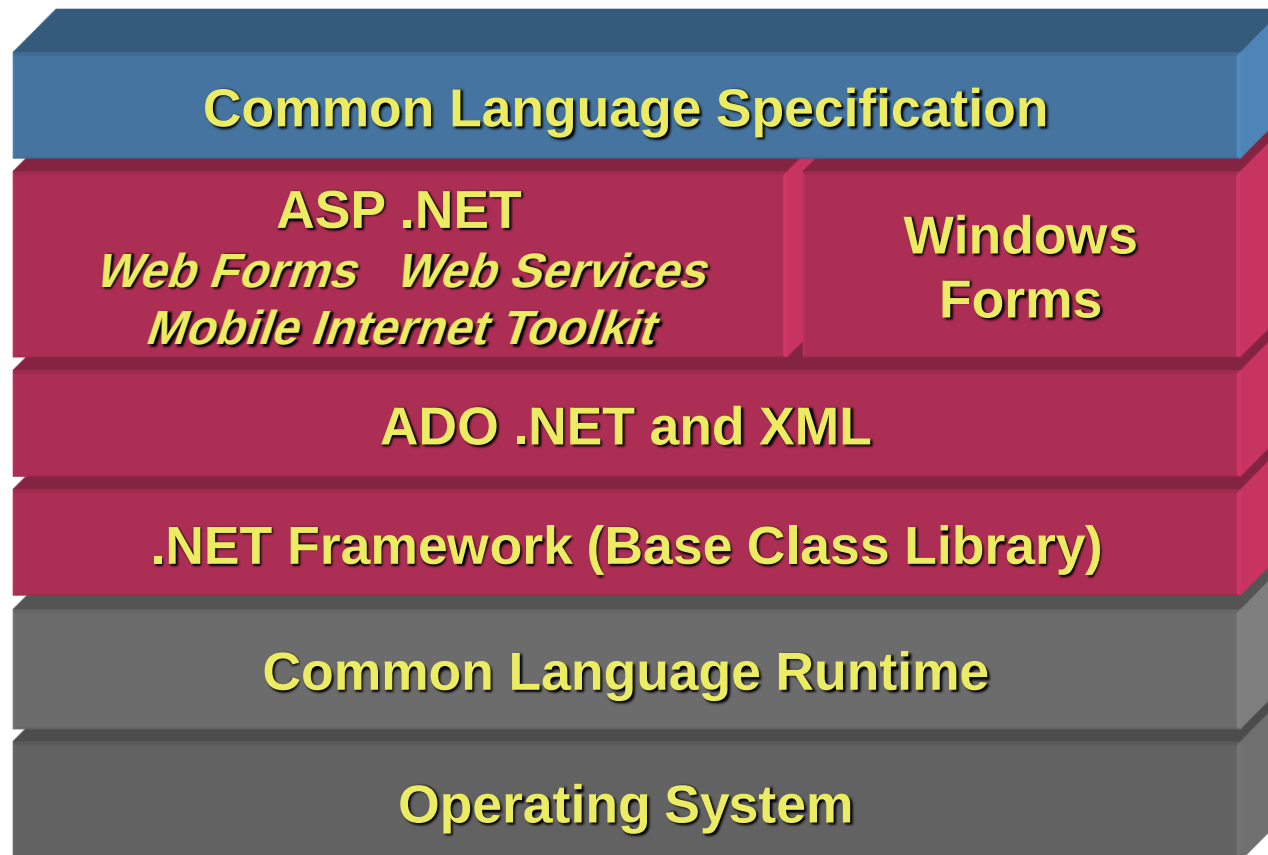
ASP.NET & Windows Forms

- Create application's Web-based user interface, Windows GUI, Web services, ...



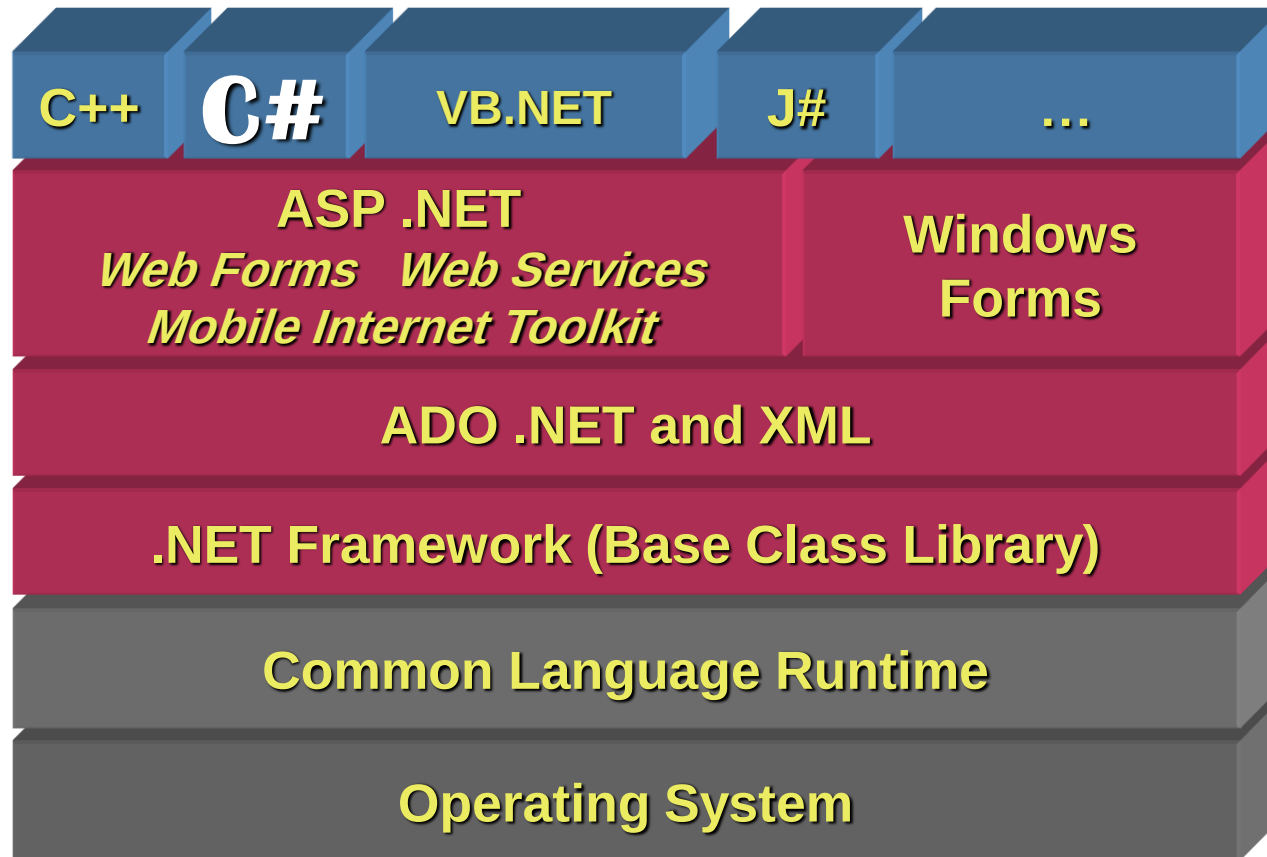
Common Language Specification

- which is a set of basic language features needed by many applications, has been defined.



Programming Languages

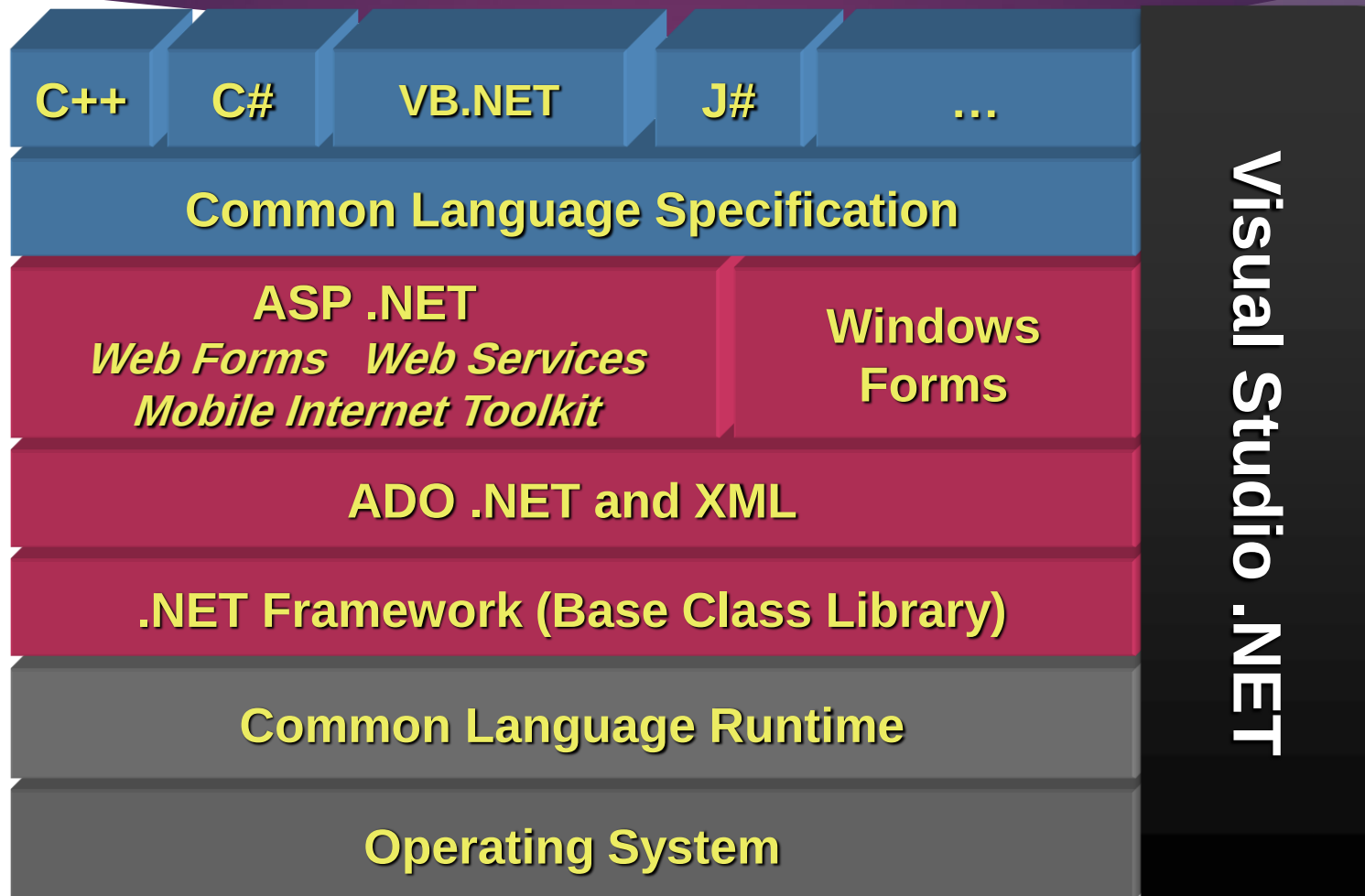
► Use your favorite language



Common Type System (CTS)

- ▶ All .NET languages have the same primitive data types.
 - ▶ An *int* in C# is the same as an *int* in VB.NET
- ▶ When communicating between modules written in any .NET language,
 - ▶ the types are guaranteed to be compatible on the binary level.

Visual Studio .NET



.Net platform features

- ▶ Automatic memory management.
- ▶ **Object Oriented features in any languages.**
- ▶ Accessing system functionality throw a hierarchical **namespace.**
- ▶ Code security.
- ▶ Interoperability with COM.

The best way to handle
a large list of system
objects and functions.

Visual Studio .NET

- ▶ Development tool that contains a rich set of productivity and debugging features.
 - ▶ Supports **managed** and **unmanaged** applications.
 - ▶ Supports C#, C++, VB.NET, ...
 - ▶ Many useful tools and wizards.
 - ▶ Windows Forms Designer.
 - ▶ ASP.NET Web Forms Designer.
 - ▶ Web Services support.
 - ▶ SQL Server integration with ADO.NET and XML.
- ▶ **VS.NET is not part of the .NET Framework.**
 - ▶ Not necessary to build or run managed code.
 - ▶ The .NET Framework SDK includes command line compilers.

Summary

- ▶ The .NET Framework
 - ▶ Dramatically simplifies development and deployment.
 - ▶ Provides robust and secure execution environment.
 - ▶ Supports multiple programming languages.

.NET Framework Namespaces

System.Web

Services

Description

Discovery

Protocols

Caching

Configuration

UI

HtmlControls

WebControls

Security

SessionState

System.WinForms

Design

ComponentModel

System.Drawing

Drawing2D

Imaging

Printing

Text

System.Data

ADO

Design

SQL

SQLTypes

System.Xml

XSLT

XPath

Serialization

System

Collections

Configuration

Diagnostics

Globalization

IO

Net

Reflection

Resources

Security

ServiceProcess

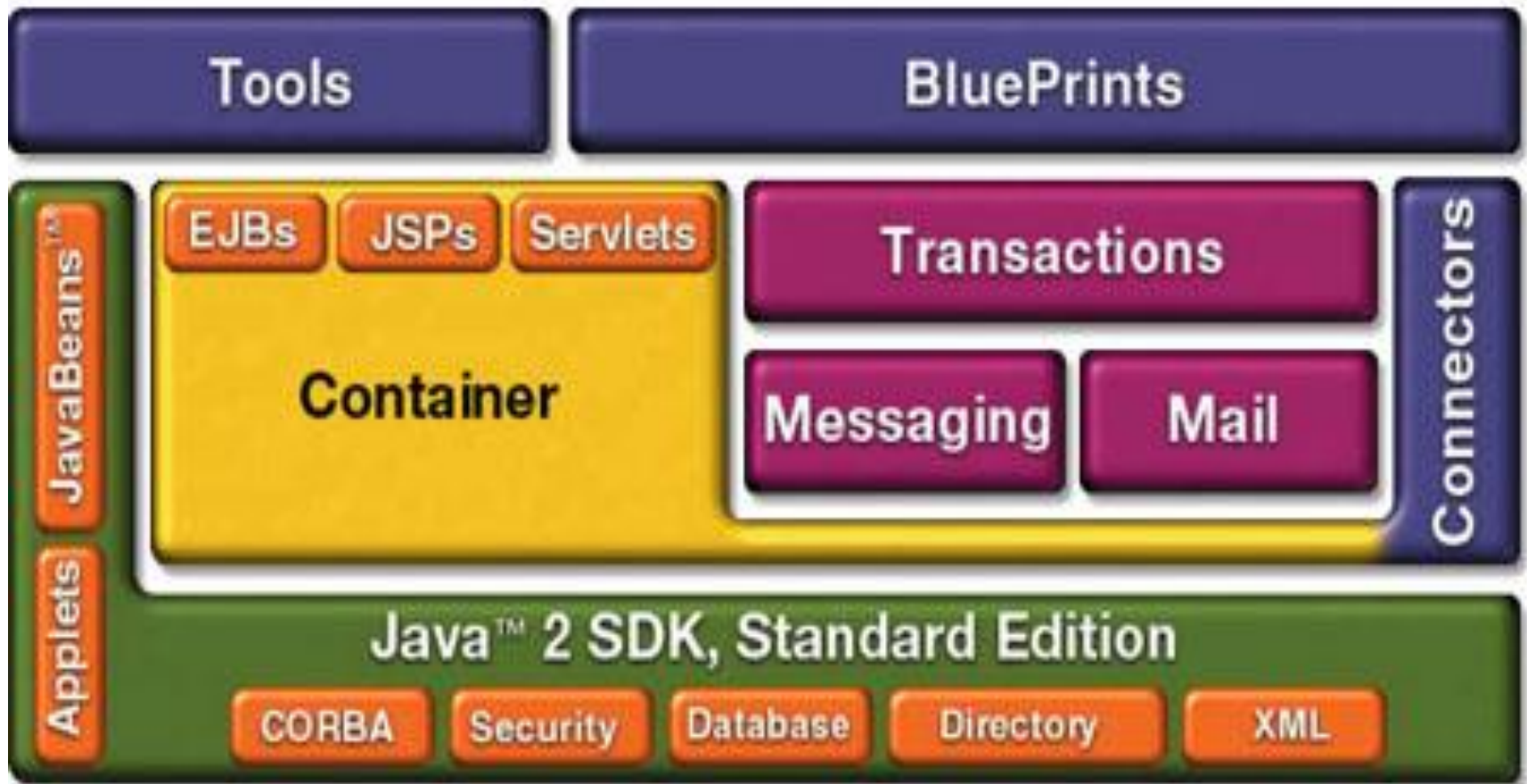
Text

Threading</

Comparison between J2EE and .NET



J2EE Components



J2EE and .NET

Execution Engine.

➤ J2EE

- ▶ Java source code compiles into machine-independent **byte code**.
- ▶ Runtime Environment : **JVM**

➤ .NET

- ▶ Any compliant language compiles into MSIL Runtime environment : CLR.

Both JVM and CLR ,support services, such as code verification, memory management via garbage collection, and code security.

J2EE and .NET

Cross Platform Portability.

➤ **J2EE**

Platform Independent .

JDK should exist on target machine.

➤ **.NET**

Supports Windows platform.

CLR should exist on target machine.

Can support other platforms provided it has its own JIT compiler .(such as **MONO**)

J2EE and .NET

Language Support.

➤ **J2EE**

- ▶ Tied to Java.

➤ **.NET**

- ▶ Language independent.
- ▶ Supports any language if mapping exists from that language to IL.

J2EE and .NET

Tools Support.

➤ **J2EE**

Can employ any number of tools.
(Like NetBeans, Eclips,...)

➤ **.NET**

Visual Studio.NET, single IDE for building an application.

Summary

- .NET Framework is a code execution platform – the environment which .NET programs run.
- .NET Framework consists of two primary parts.
 - Common Language Runtime and .NET Class Libraries.
- The **CLS** (Common Language Specification) allows different languages to interact seamlessly.
- The **CTS** (Common Type System) allows all languages to share base data types.

Summary

- .NET languages are compiled to MSIL by their respective compilers.
- MSIL code is compiled to machine code by the JIT compiler.
- All .NET languages have equal access to the FCL (Framework Class Library).
 - which is a rich set of classes for developing software.
- Base Class Library is set of basic classes.
 - Collections, I/O, Networking, Security, etc.
- ADO.NET provides .NET applications with access to relational databases

Summary

- .NET has great XML support .
- Windows Forms provides GUI interface for the .NET applications.
- ASP.NET allows creating web interface to .NET applications.
- Web Services expose functionality from web sites and make it remotely accessible through standard XML-based protocols.
- Visual Studio .NET is powerful development IDE for all .NET languages and technologies.

What's new in .NET Framework 4.5?

Windows Presentation Foundation

- Built-in Ribbon controls ★
- Databinding improvements
- Ability to add breakpoints to databindings
- Data source change aware views (Live Shaping) ★
- Validation improvements
- Improved legacy UI integration
- Dispatcher improvements
- Speed-up of large data sets

Windows 8 support ★

Support for Windows Runtime (WinRT)

.NET Profile for Metro-style apps

Improved support for sharing DLLs between .NET profiles

ASP.NET

ASP.NET Web API - a new framework for REST endpoints ★

Support for implementing WebSocket receivers ★

Built-in JavaScript + CSS combining and minification ★

ASP.NET MVC 4

Async controllers

Built-in mobile templates + jQuery Mobile support

Alternate views (e.g. print version, mobile site)

Support for Recipes: intelligent codegen ★

ASP.NET Web Pages 2

New site templates

Versatile validation support

Support for OAuth and OpenID ★

Built-in map embedding tools; supports Google, Bing and others