



Overview of .NET

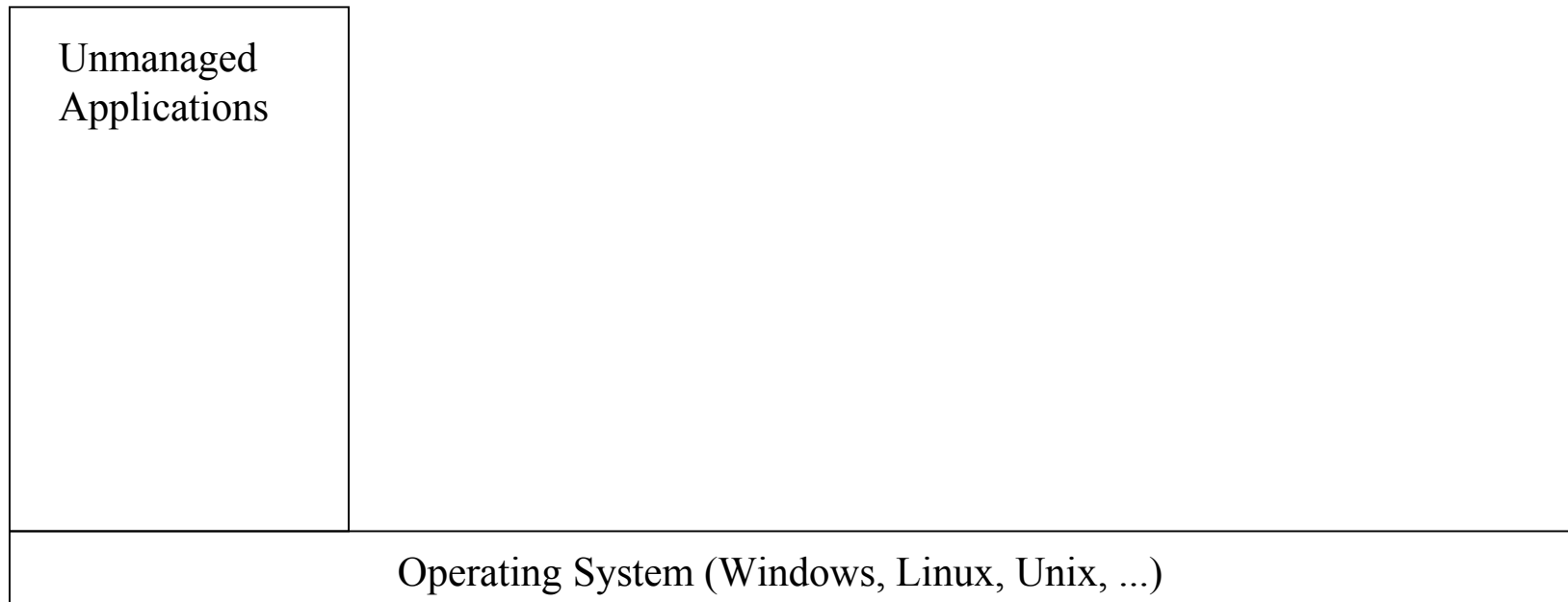
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What is .NET?



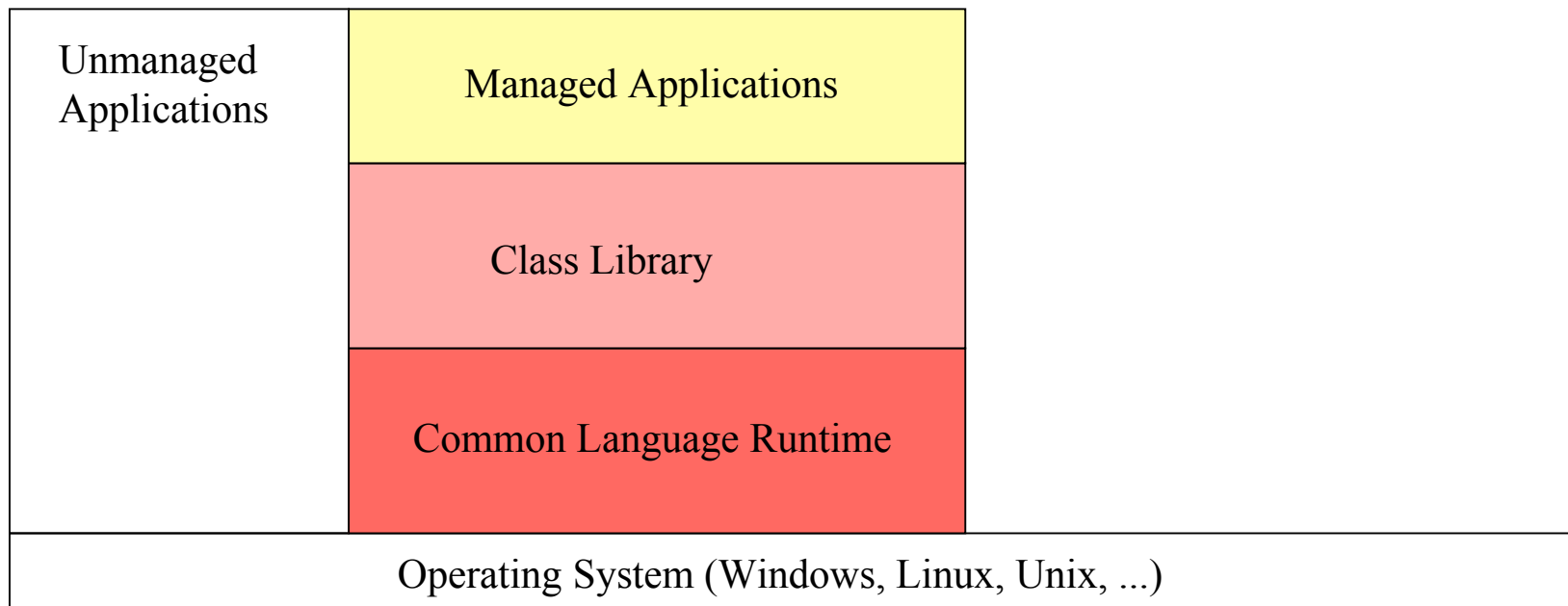
A new Software platform for the desktop and the Web



What is .NET?



A new Software platform for the desktop and the Web



Common Language Runtime

interoperability, security, garbage collection, versioning, ...

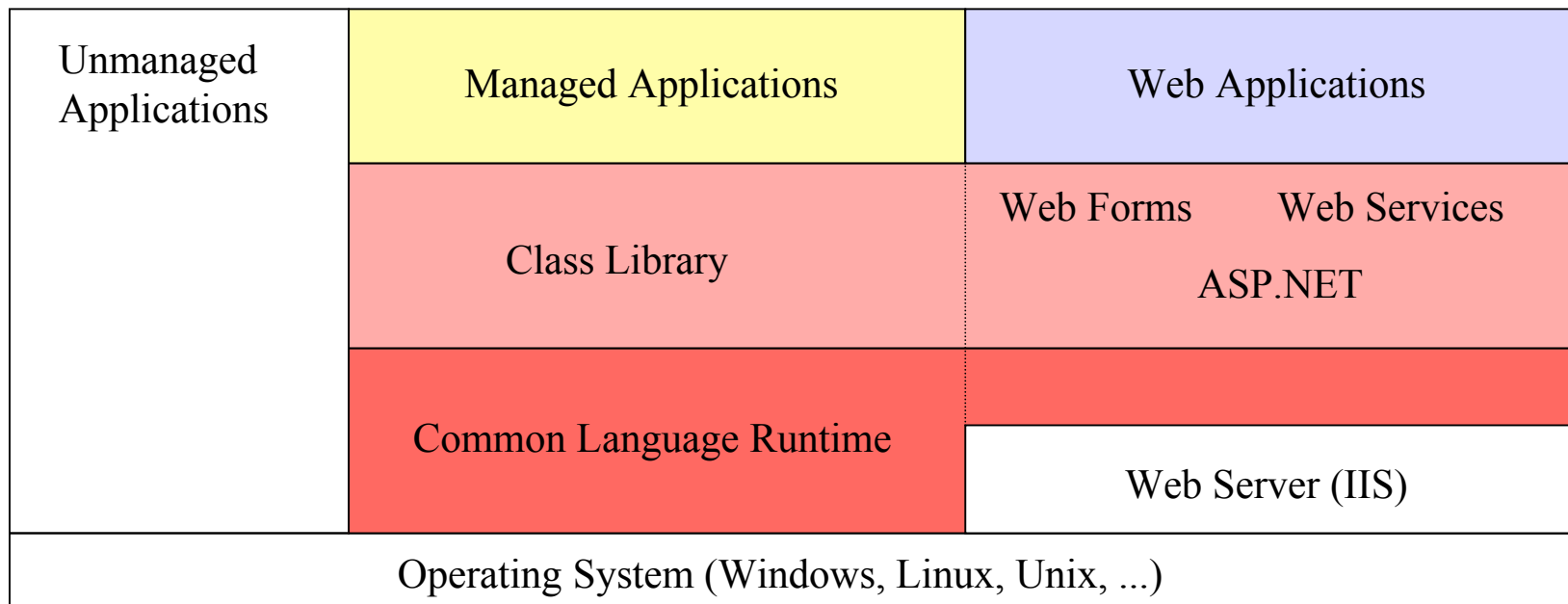
Klassenbibliothek

GUI, collections, threads, networking, reflection, XML, ...

What is .NET?



A new Software platform for the desktop and the Web



ASP.NET,
Web Forms

Web GUI (object-oriented, event-based, browser-independent)

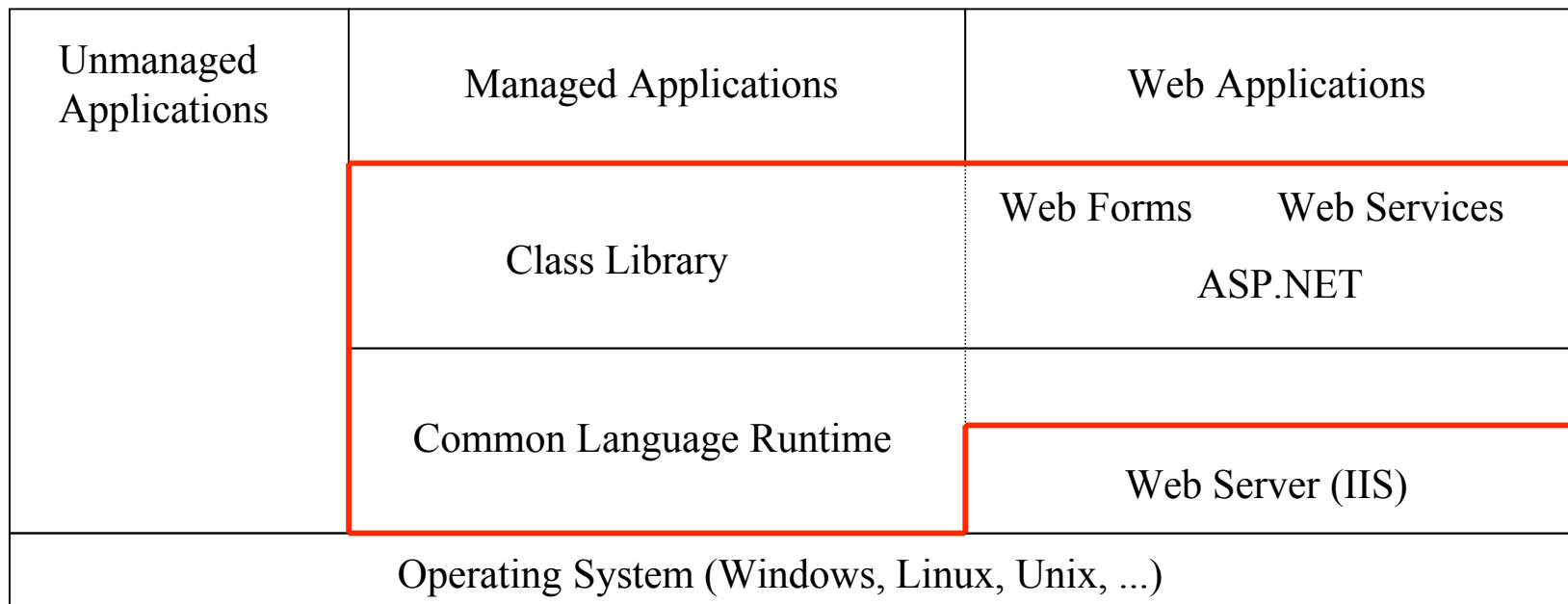
Web Services

distributed services over RPC (SOAP, HTTP)

What is .NET?



A framework and more ...



.NET Framework

- + **Tools** (Visual Studio .NET, ildasm, gacutil, ...)
- + **Server** (SQL Server, BizTalk Server, ExchangeServer, ...)
- + **Services** (My Service, Passport Service, ...)

Goals of .NET



Uniform model for desktop and Web programming

So far

Desktop programming

object-oriented
compiled (C/C++, Fortran, ...)
extensive class libraries

Web programming

ASP (not object-oriented)
interpreted (VBScript, Javascript, PHP, ...)
specialized libraries

Under .NET

Desktop and Web programming

object-oriented (even ASP.NET)
compiled (C#, C++, VB.NET, Fortran, ...)
uniform class library

Goals of .NET



Interoperability between programming languages

So far

- millions of lines of code in C++, Fortran, Visual Basic, ...
- very limited interoperability

Under .NET

- binary compatibility between more than 20 languages (C#, C++, VB.NET, Java, Eiffel, Fortran, Cobol, ML, Haskell, Pascal, Oberon, Perl, Python, ...)

class in VB.NET

```
Public Class A
  Public x As Integer
  Public Sub Foo() ...
End Class
```

subclass in C#

```
class B : A {
  public string s;
  public void Bar() {...}
}
```

used in Eiffel

```
class Client feature
  obj: B;
  ...
  create obj;
  obj.Bar;
  ...
end
```



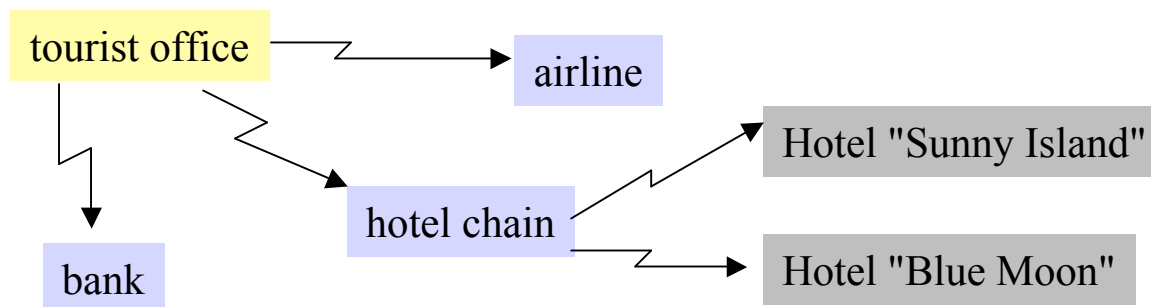
Goals of .NET

Web Services: distributed applications on the Internet

Usage of the Internet so far

- Email
- Web browser (presents data to human users)

Under .NET: B2B applications without a Web browser



Based on simple standards

- HTTP
- SOAP (XML)
- remote procedure call



Goals of .NET

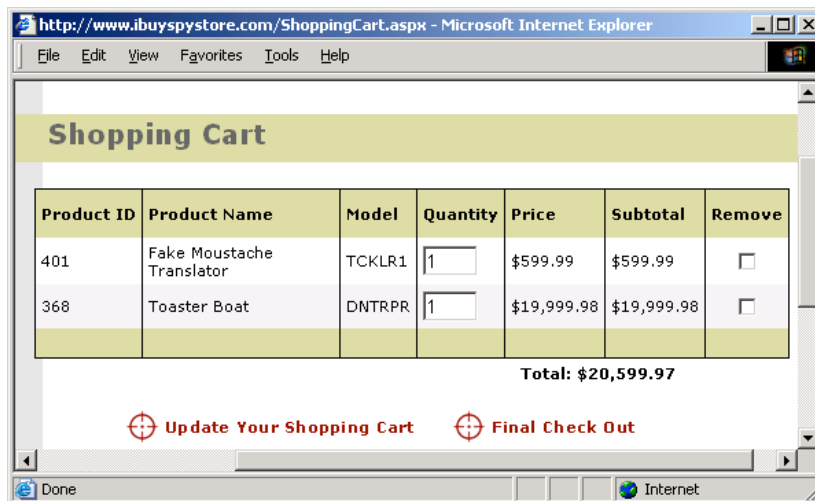
Simpler programming of dynamic Web pages

So far

- ASP (mixture of HTML and VBScript or Javascript)

Under .NET

- ASP.NET (clean separation of HTML and script code)



object-oriented

event-based

rapid application development (RAD)

allows user-written GUI elements

efficient (compiled server scripts)

automatic state management

authorisation / authentication

...

Goals of .NET



More quality and convenience

- Security

- strong static typing
- run-time type checks (no more buffer overruns!)
- garbage collection
- CIL code verifier
- public key signatures of code
- role-based access rights
- code-based access rights

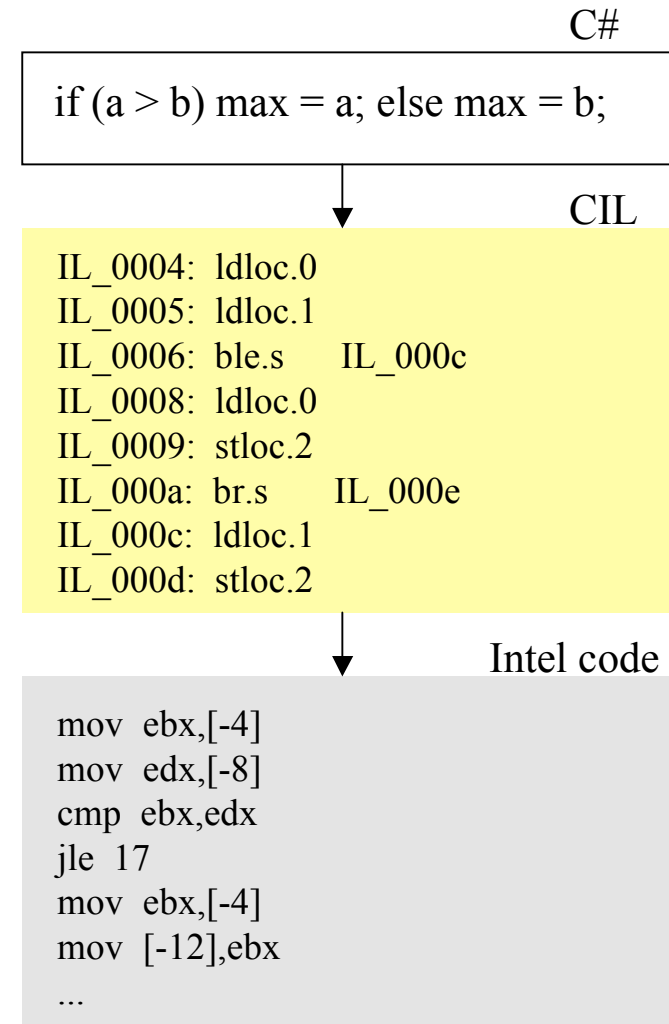
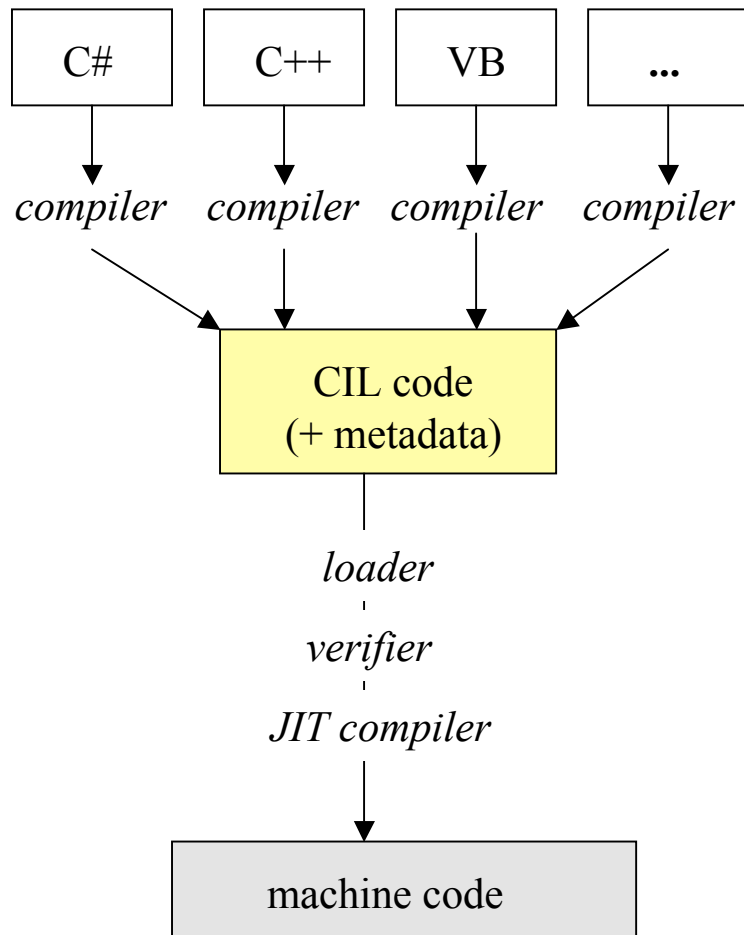
- Side by Side Execution

- versioning
- end of "DLL hell"

- Simpler Software Installation

- no more registry entries
- clean and simple de-installation

Interoperability



Assemblies



Assemblies are the smallest unit for

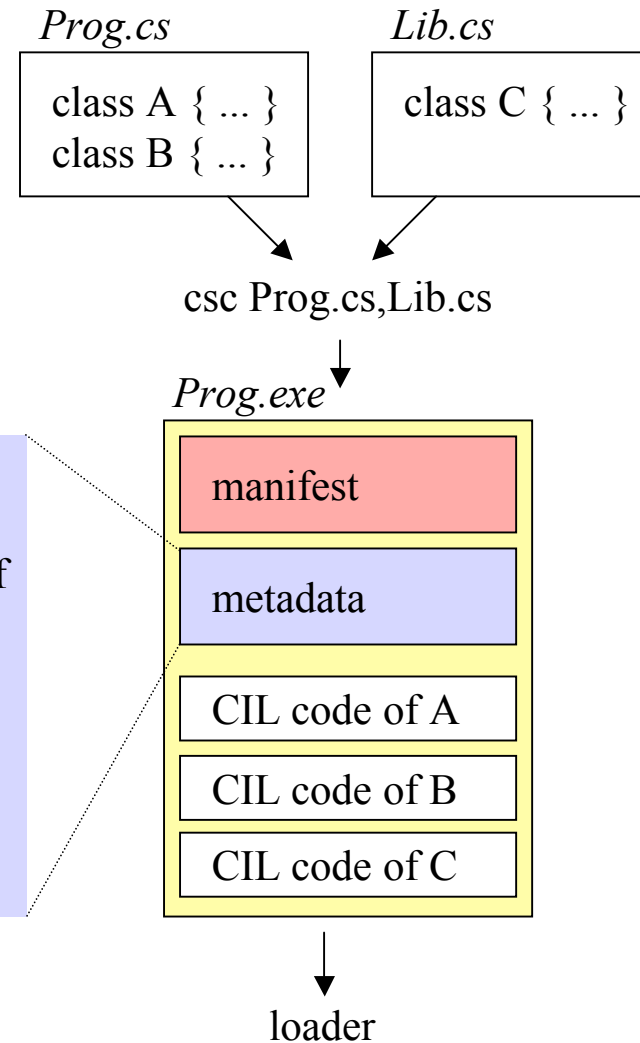
- deployment
- versioning
- dynamic loading

metadata is used for:

- dynamic loading
- versioning
- reflection

version number
public key
interface description of

- classes
- methods
- variables
- parameters
- types
- ...



Literature



C#

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Web Sites

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- msdn.microsoft.com/net/
- www.gotdotnet.com
- www.devhood.com
- www.asp.net
- dotnet.jku.at

Reference information and tutorials in the .NET SDK