



*An Overview
of the .NET Technology*

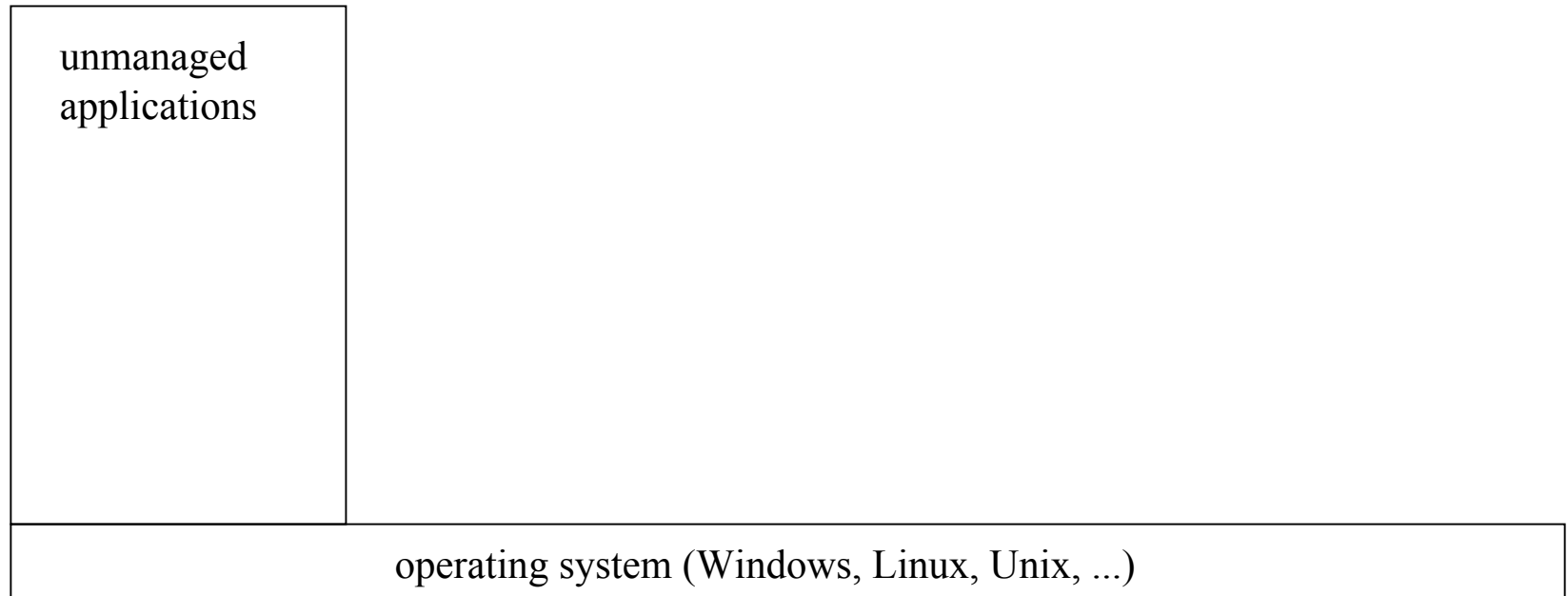
Hanspeter Mössenböck





What is .NET?

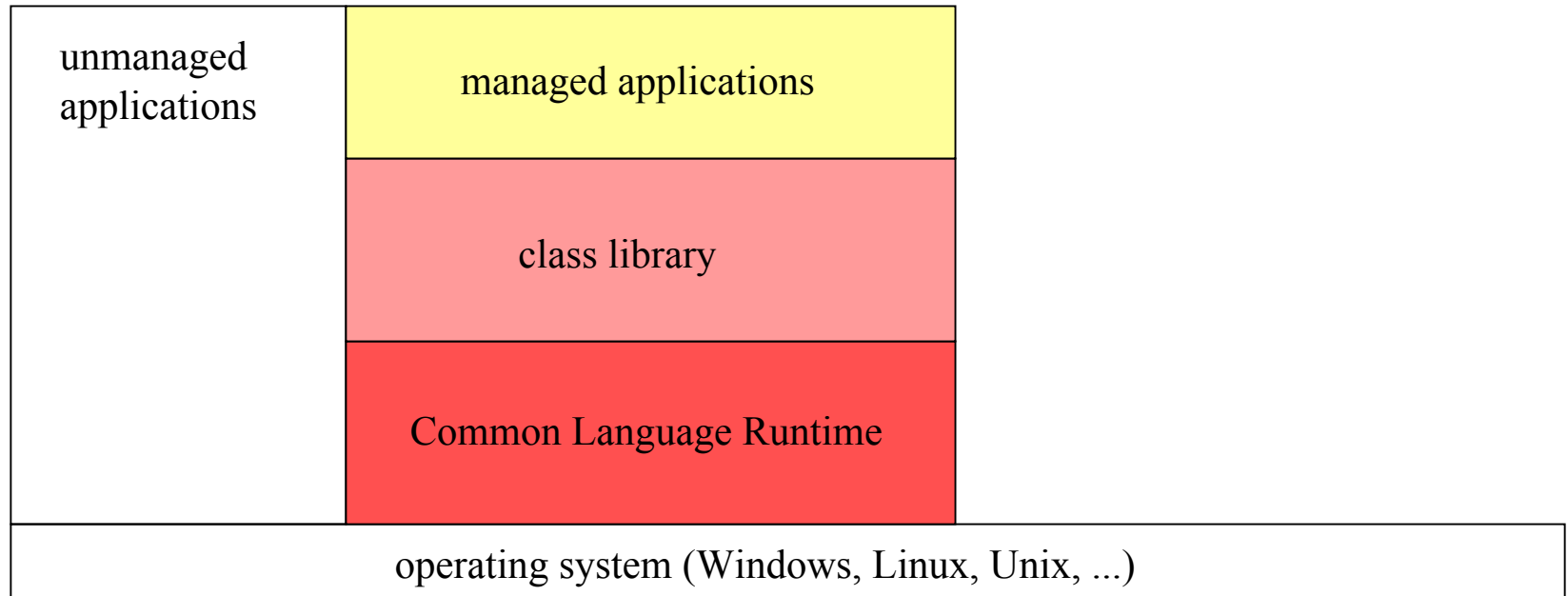
A new software platform for the desktop and the Web





What is .NET?

A new software platform for the desktop and the Web



Common Language Runtime

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

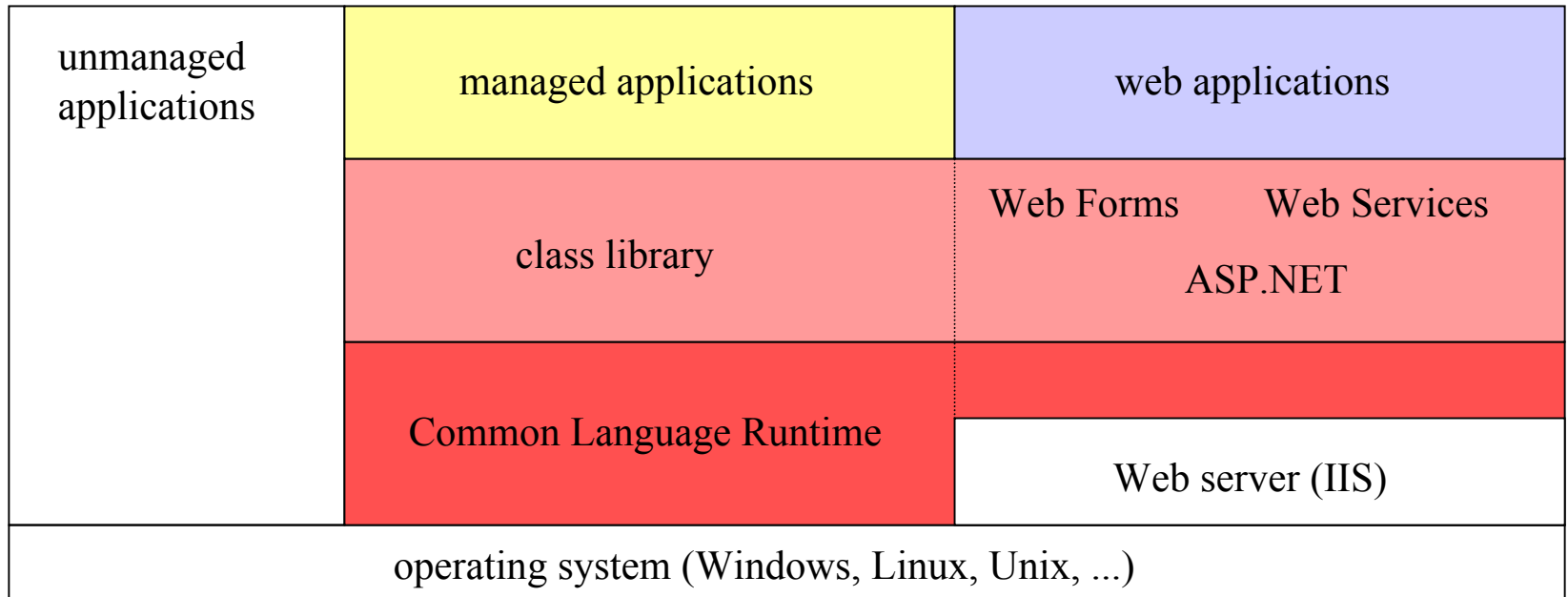
class library

GUI, collections, threads, network, 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)

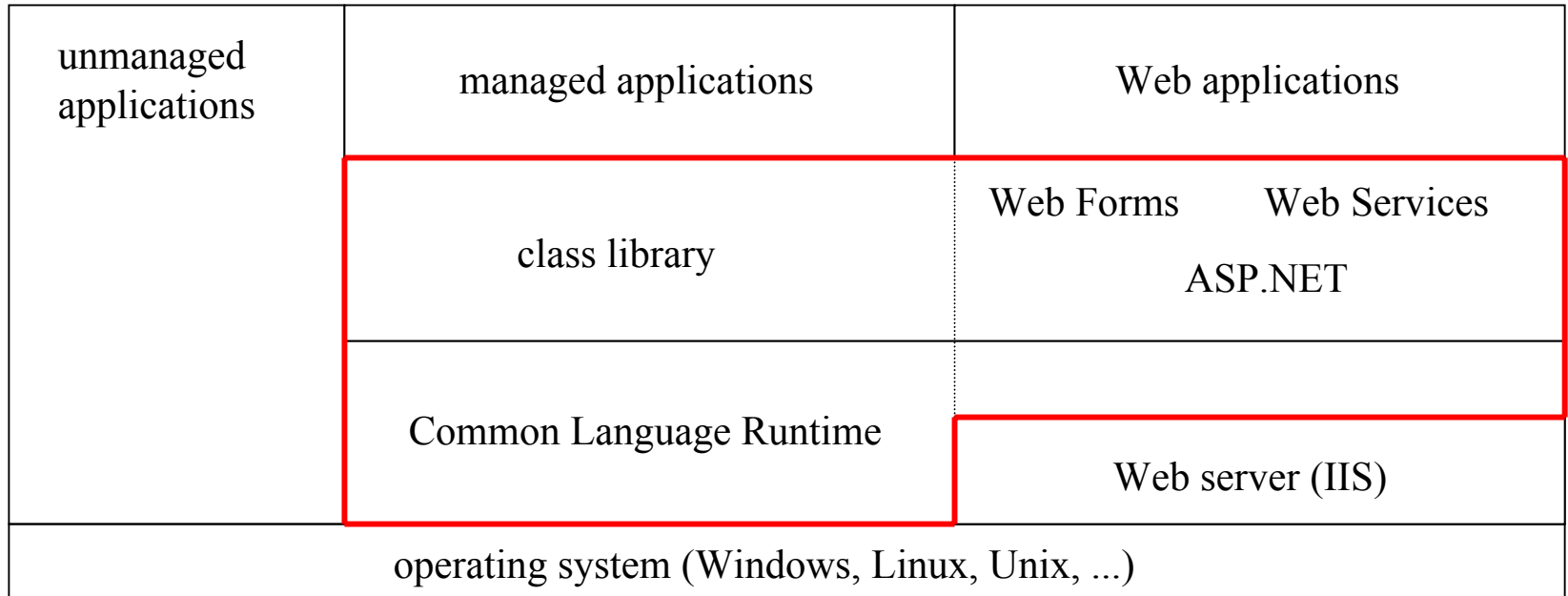
Web Services

distributed services over RPC (SOAP, HTTP)

What is .NET?



A framework and more ...



.NET Framework

- + **tools** (Visual Studio .NET, ildasm, gacutil, ...)
- + **servers** (SQL server, BizTalk server, Exchange server, ...)
- + **services** (My Services, Passport service, ...)



Goals of .NET

To unify desktop and Web programming

So far

Desktop programming

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

Web programming

ASP (not object-oriented)
interpreted (VBScript, Javascript, PHP, ...)
special library



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special library

Under .NET

Desktop and Web programming

object-oriented (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

Goals of .NET

Interoperability between programming languages

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- 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 browsers (show information for human users)

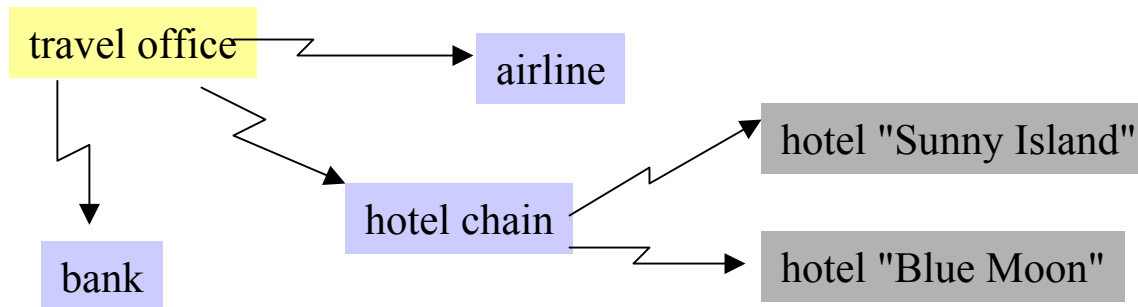
Goals of .NET

Web Services: distributed applications on the Internet

Usage of the Internet so far

- Email
- Web browsers (show information for human users)

Under .NET: B2B applications without a Web browser



Based on simple standards

- HTTP
- SOAP (XML)
- Remote Procedure Calls



Goals of .NET

Simpler dynamic Web pages

So far

- ASP (mixture of HTML and VBScript or Javascript)

Goals of .NET

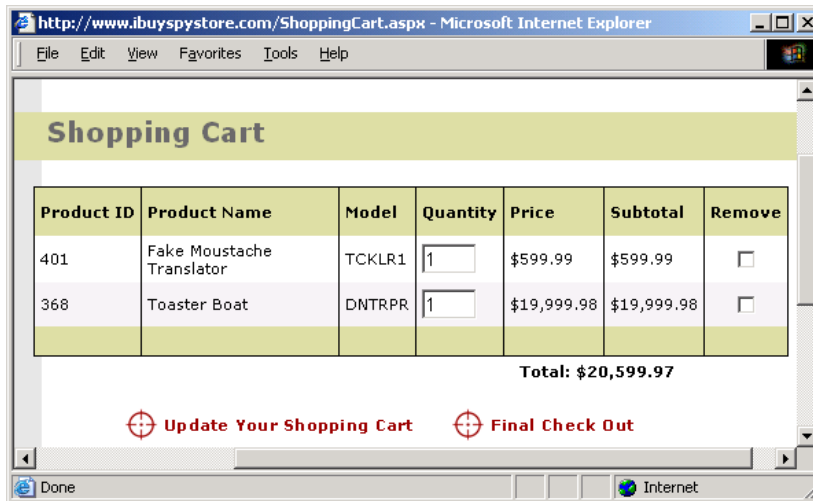
Simpler dynamic Web pages

So far

- ASP (mixture of HTML and VBScript or Javascript)

Under .NET

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



object-oriented

event-based

interactively composable (RAD)

custom GUI elements possible

efficient (compiled server code)

state management

authorisation / authentication

...

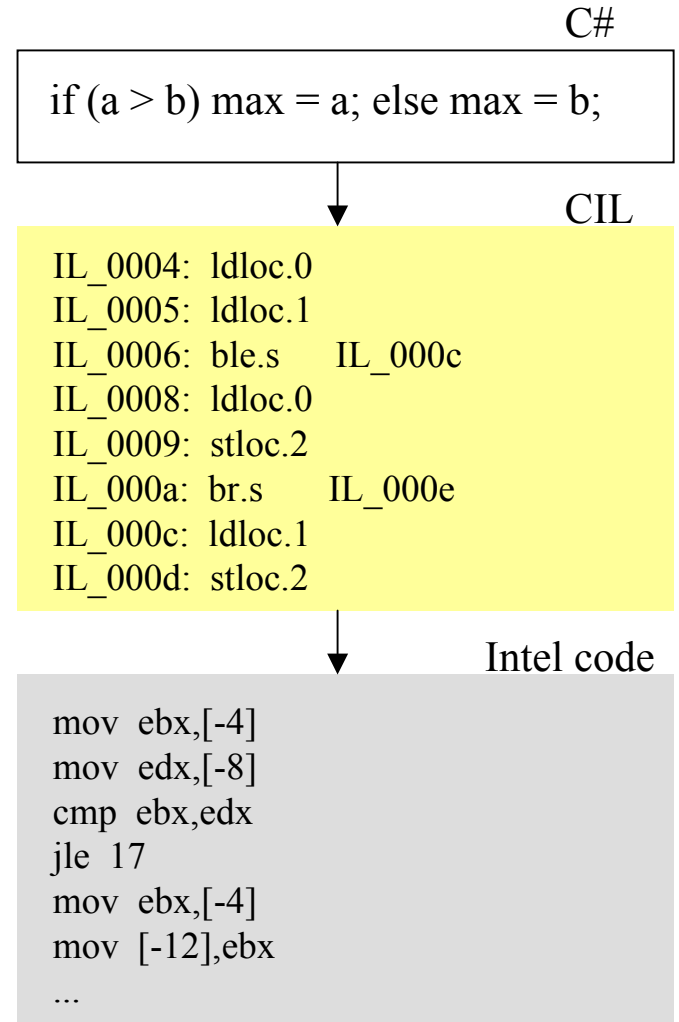
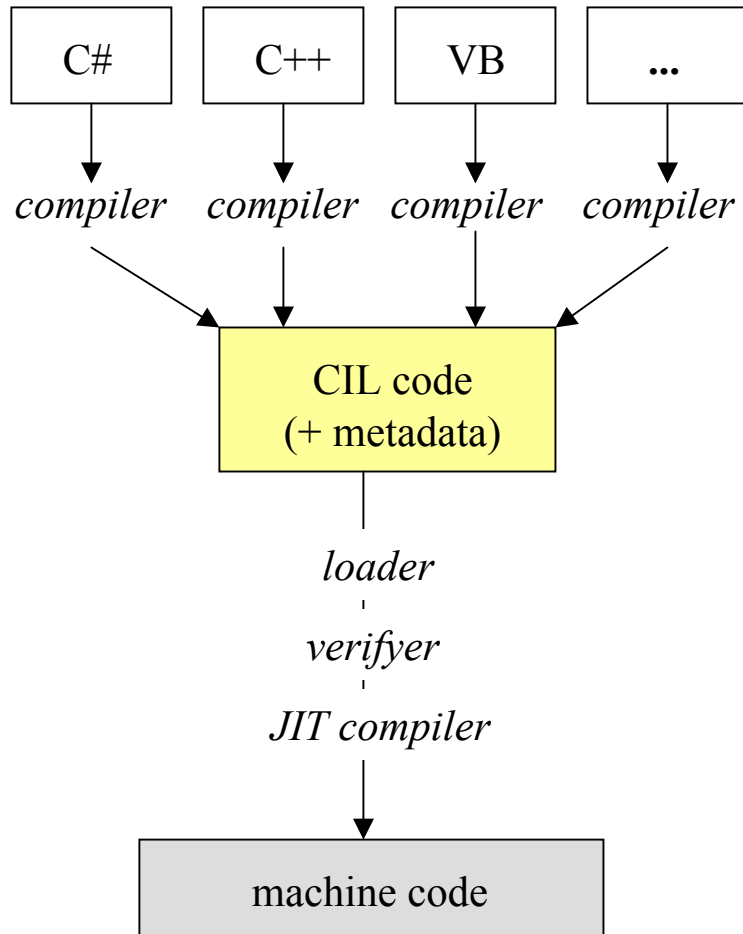


Goals .NET

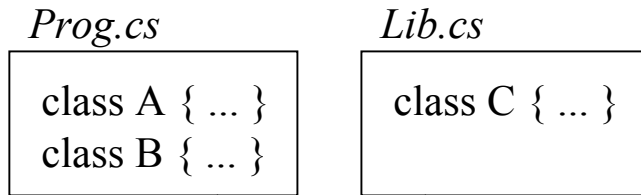
More quality and convenience

- Security
 - public key signatures
 - code-based access rights
- Side by side execution
 - end of "DLL hell"
 - versioning
- Zero-impact installation
 - no Registry entries necessary
 - clean deinstallation
- Different clients
 - PCs, mobiles, embedded systems

Interoperability

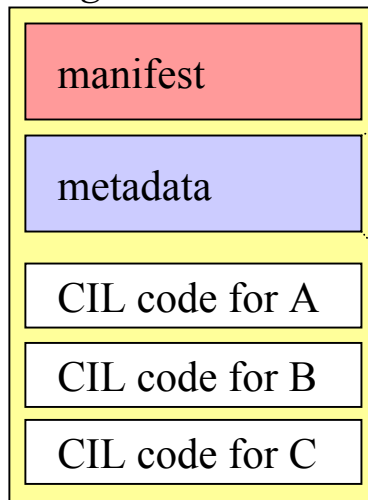


Assemblies



csc Prog.cs,Lib.cs

Prog.exe



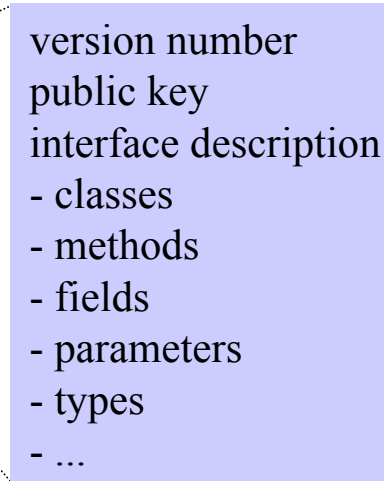
loader

Assemblies are the smallest units for

- deployment
- versioning
- loading

allows:

- dynamic loading
- version checking
- reflection



Literature



Web

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

Books

- Beer, Birngruber, Mössenböck, Wöß: **Die .NET-Technologie**. dpunkt.verlag, 2003
- Albahari, Drayton, Merrill: **C# Essentials**, O'Reilly, 2001
- Robinson et al.: **Professional C#**, Wrox Press, 2001
- Richter: **Applied Microsoft .NET Framework Programming**, Microsoft Press, 2002
- Watkins et al.: **Programming in the .NET Environment**, Addison Wesley, 2002
- Box: **Essential .NET**, Addison Wesley, 2002