# Ignify Consulting

## C #

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## Topics covered:

- Introduction to .NET framework
- Features in c#
- Features inherited from other languages
- What ‘s new in c#

## .NET Runtime features :

- Garbage Collection
- Exception handling
- Events
- Language Independent
- Runtime type verification
- Meta Data

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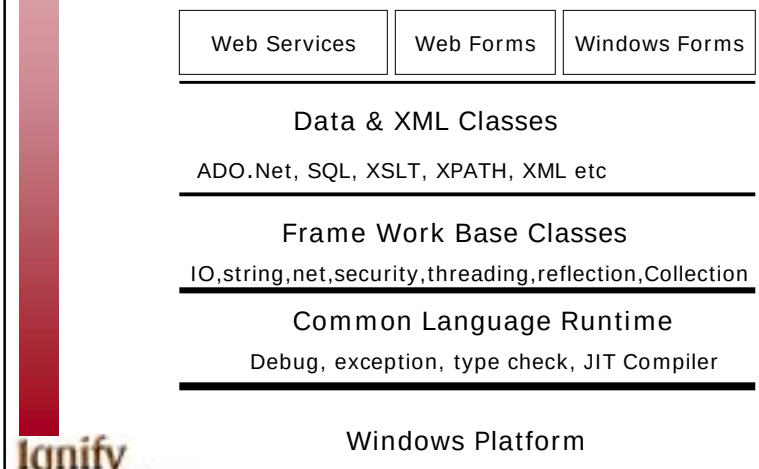
## .NET Framework

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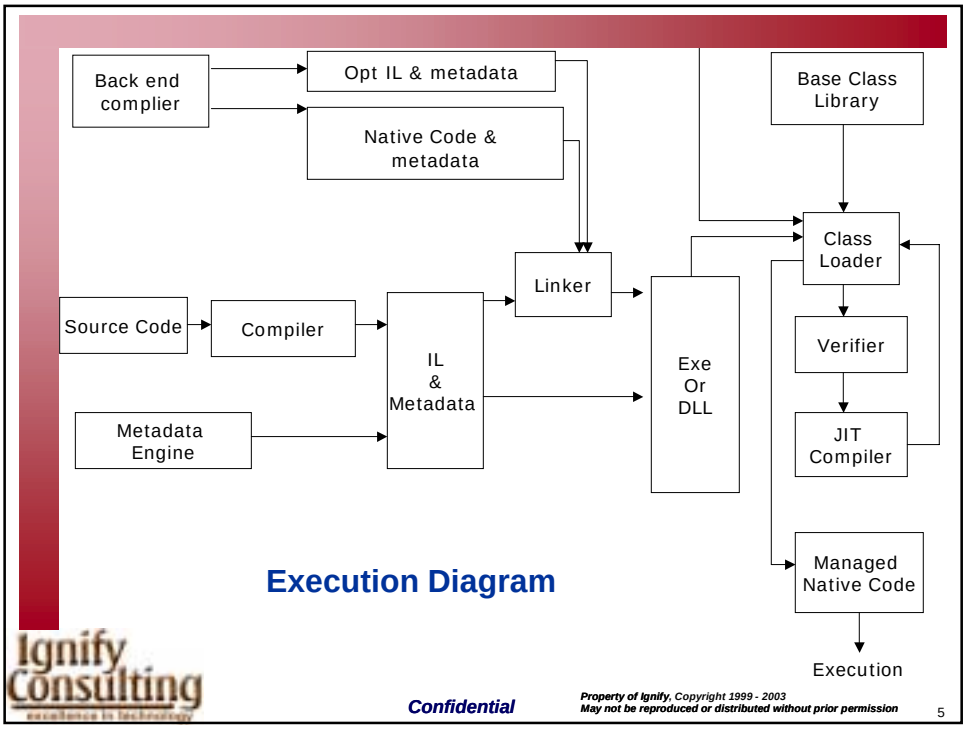


## Execution Diagram

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## Features of C# :

- Static Typing
- Runtime Polymorphism
- exceptions
- Reference type

C#, C++ and Java

- compile time polymorphism
- value types
- operator overloading

C# and c++

- unified type system

- virtual execution system
- Object super base class
- single public inheritance
- multiple public realization
- non deterministic finalization
- garbage collection
- multi threading
- reflection

C# and Java

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## Sample code of IL or MSIL

Hiker::Main : void()

```
.method public hidebysig static void Main() il managed
{
  .entrypoint
  // Code size       23 (0x17)
  .maxstack  2
  .locals (int32 V_0,
           int32 V_1)
  IL_0000:  ldc.i4.s   54
  IL_0002:  stloc.0
  IL_0003:  ldc.i4.s   13
  IL_0005:  stloc.1
  IL_0006:  ldloc.0
  IL_0007:  ldloc.1
  IL_0008:  div
  IL_0009:  call       void [mscorlib]System.Console::WriteLine(int32)
  IL_000e:  ldloc.0
  IL_000f:  ldloc.1
  IL_0010:  rem
  IL_0011:  call       void [mscorlib]System.Console::WriteLine(int32)
  IL_0016:  ret
} // end of method Hiker::Main
```

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## Sample Code Of C#

```
using System;
public class HelloWorld {
        public static void Main() {
        // Use the  system console object
        System.console.WriteLine("Hello World");
        }
}
```

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## C++ Preprocessor Holdovers

#ifdef - #define - #ifndef - #endif

- compile direction only, no macro direction

No actual preprocessor

- no # include, no #pragma

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## Visibility

public, private, protected, internal

Internal is assembly scope

- Basic compiled unit

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## Static & Const

- Static
- Const
- Read Only
  - For classes and structs that need to be constructed, but are constant

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## NonJava Non C++Keywords

- Foreach (int a in intArray)
  - iterate through an array or indexible type
- Lock
  - Multithreaded exclusion
- Checked or unchecked
  - Numerical overflow

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## Function Side Effects

Void int AnyFunction{ret int x, out int y, int z }

- - ret
  - Return types, allows pass by reference
    - must be initialized before call
- - out
  - input/ output values

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## Class Casting

Typeof (java instanceof)

- for class casting

as

- forces a cast to an interface

is

- checks if an object implements an interface

- if (obj is IMyInterface)

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## Properties:Built-in Accessors

- get()
  - Automatically invoked when an instance is on the right of an assignment
- set()
  - Automatically invoked when an instance is on the left of an assignment

```
Public int  s {
        get{return s;}
        set{s=value;} //value is a keyword,of type s
        };
   s=3; // Implicit invocation of s.set()
```

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## Value & Reference Type

- Class
  - Reference type
    - Heap Allocated
- Struct
  - Value type
  - Stack allocated
- Interface
  - For multiple inheritence

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## Versioning & Virtual Functions

- new
  - operator applied to subclass functions indicating they are a “new” name than an inherited virtual function
- Override
  - operator applied to subclass functions indicating they override a similarly named virtual function
  - class c { virtual foo(); };
    class d : c { override foo(); new foo(); };

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## Operator Overloading

Overload any C++ operator

overloaded [x] operator is special: an “indexer”

```
class c {
public object this.[int i] {
      get{return x[i];}
      set{x[i] = value;}
};
```

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## Unsafe Code

- Unsafe
  - allows pointer arithmetic
- Fixed
  - specifies the location in memory must stay the same

Code using unsafe

- fails type checking
- cannot be downloaded and run on foreign system

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## Attributes

- Compiler generated or User defined
- live in the program meta data
- dynamically query able
- inserted in code like comments

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## XML + Attributes = JavaDoc

Parsed by the parser, rather than a separate engine

XML comments describe code

- Comments type checked with code they reference

Generates XSL documentation page

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