Introduction to Managed Languages

Introducing C#

Contents

- Introduction to Managed Languages
- Managed vs Unmanaged
- The .NET Framework
- Summary
- References

Managed Languages

- What is a Managed Language? (or Managed Code)
  - Can be used to describe any programming language that runs on an intermediate virtual machine
  - Uses a Common Language Runtime (CLR – More on this soon)
  - Makes use of just in time (JIT) compilation

Managed languages and JIT

- Features of JIT Languages
  - Compiled into an intermediate language, or common intermediate language (CIL) in the case of .NET languages
  - The JIT compiles the CIL at runtime into native code for the processor to execute
  - Speed is very comparable to unmanaged languages such as C / C++

Managed vs Unmanaged

- Unmanaged Code
  - Compiled and linked into machine language
  - Executable will only work on the target platform
  - No requirements for any runtime support

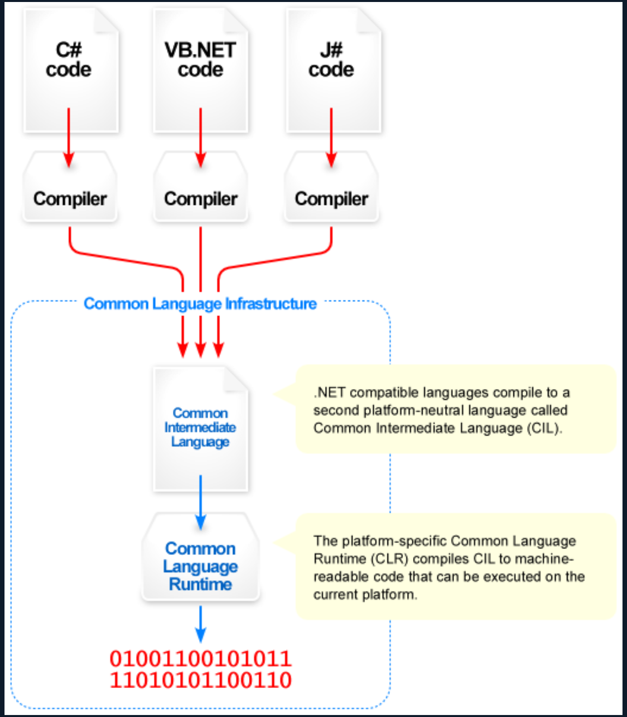
Managed vs Unmanaged

- Managed Code
  - Is compiled into an intermediate language
  - Code is highly transportable
  - Much more meta data available at run time for error detection
  - Requires CLR environment to be installed on the target machine

Introducing .NET

- What is .NET?
  - A software framework developed by Microsoft
  - Large code library
  - Covers several programming languages
  - Offers programming language interoperability

.NET’s implementation of the CLR



.NET compatible languages compile to a second platform-neutral language called Common Intermediate Language (CIL).

The platform-specific Common Language Runtime (CLR) compiles CIL to machine-readable code that can be executed on the current platform.

Summary

- Managed Languages operate on a common language runtime
  - Managed Languages are compiled into an Intermediate Language
- .NET is Microsoft’s framework for languages that execute in the CLR

References

- Kate Gregory, 2003, *Managed, Unmanaged, Native: What Kind of Code is This?*
  - http://www.developer.com/net/cplus/article.php/2197621/Managed-Unmanaged-Native-What-Kind-of-Code-Is-This.htm
- Microsoft, 2014, *.NET Framework 4.5*
  - https://msdn.microsoft.com/en-us/library/vstudio/w0x726c2(v=vs.110).aspx

Canberra Institute of Technology

aie
SPECIALIST EDUCATORS IN GAMES, ANIMATION & FILM VFX