

NET V-4.0 Core New Features and Improvements

The following sections describe new features and improvements provided by the common language runtime and the base class libraries.

1. **Diagnostics and Performance** - Starting with the .NET Framework 4, you can get processor usage and memory usage estimates per application domain.
2. The **System.Runtime.ExceptionServices.HandleProcessCorruptedStateExceptionsAttribute** attribute enables managed code to handle exceptions that indicate corrupted process state.
3. **Globalization** - provides new neutral and specific cultures, updated property values, improvements in string handling
4. **Garbage Collection** - provides background garbage collection for better performance
5. **Code Contracts** - Code contracts let you specify contractual information that is not represented by a method's or type's signature alone. The new **System.Diagnostics.Contracts** namespace contains classes that provide a language-neutral way to express coding assumptions.
6. **Design-Time-Only Interop Assemblies** - In the .NET Framework 4, compilers can embed type information from interop assemblies, selecting only the types that an application (for example, an add-in) actually uses. Type safety is ensured by the common language runtime.
7. **Dynamic Language Runtime** - **System.Dynamic** namespace and The *dynamic language runtime* (DLR) is a new runtime environment that adds a set of services for dynamic languages to the CLR. **System.Runtime.CompilerServices** namespace.
8. The expression trees are extended with new types that represent control flow, for example, **System.Linq.Expressions.LoopExpression** and **System.Linq.Expressions.TryExpression**. These new types are used by the dynamic language runtime (DLR) and not used by LINQ.
9. **Covariance and Contravariance Generics** - Several generic interfaces and delegates now support covariance and contravariance.
10. **System.Numerics.BigInteger** structure is an arbitrary-precision integer data type that supports all the standard integer operations, including bit manipulation.
11. **System.Numerics.Complex** structure represents a complex number that supports arithmetic and trigonometric operations with complex numbers.
12. **File System Enumeration Improvements** - New file enumeration methods improve the performance of applications that access large file directories or that iterate through the lines in large files.
13. **Memory-Mapped Files** - now supports **memory-mapped files**. You can use memory-mapped files to edit very large files and to create shared memory for interprocess communication.
14. **64-Bit Operating Systems and Processes** - Identify 64-bit operating systems with the properties **Environment.Is64BitOperatingSystem** and **Environment.Is64BitProcess**. Specify a 32-bit or 64-bit view of the registry with the **Microsoft.Win32.RegistryView** enumeration when opening base keys.
15. **NET V40. Other Issues:**
 - a. Control identifier scheme changed in version 4.0 from .NET versions 2.0 and 3.5.
 - i. The "ctrl100_" was removed from the front of the controls identifier.
 - ii. put this in the web.config file: `<pages clientIDMode="AutoID"></pages>`