Comparative Study on Various Version of .Net Framework

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Abstract---.NET Framework is a software framework developed by Microsoft that runs primarily on Microsoft Windows. It includes a large library and provides language interoperability (each language can use code written in other languages) across several programming languages. Programs written for .NET Framework execute in a software environment, known as the Common Language Runtime (CLR), an application virtual machine that provides services such as security, memory management, and exception handling. The class library and the CLR together constitute .NET Framework. When the new versions of .Net framework are release it overcomes the problem of early version and add new features in its which provide better usability of it.

Keywords: Framework, Compatibility, Extensibility, ADO.Net, Interoperability.

I. INTRODUCTION

.NET Framework’s Base Class Library provides user interface, data access, database connectivity, cryptography, web application development, numeric algorithms, and network communications.

Programmers produce software by combining their own source code with .NET Framework and other libraries.

.NET Framework is intended to be used by most new applications created for the Windows platform. Microsoft also produces an integrated development environment largely for .NET software called Visual Studio. The feature of reflection is provided in .Net Framework [1]. The General Design features that are provided in .Net Framework’s are Interoperability, Common Language Runtime engine, Language independence, Base Class Library, Simplified deployment, Security, Portability. Custom attributes are one of the most innovative features of the .NET framework [2]. The Fig 1 shows the .Net Framework stack.

II. NET FRAMEWORK 2.0 FEATURES

A. ADO.NET

New features in ADO.NET include support for user-defined types (UDT), asynchronous database operations, XML data types, large value types, snapshot isolation, and new attributes that allow applications to support multiple active result sets (MARS) with SQL Server 2005. .NET framework is a rather radical approach to make the development of Windows more component-oriented [4].

B. ASP.NET

The Microsoft .NET Framework 2.0 includes significant enhancements to all areas of ASP.NET. For Web page development, new controls make it easier to add commonly used functionality to dynamic Web pages. New data controls make it possible to display and edit data on an ASP.NET Web page without writing code. An improved code-behind model makes developing ASP.NET pages easier and more robust. Caching features provide several new ways to cache pages, including the ability to build cache dependency on tables in a SQL Server database. It is possible to use Frame Oriented Programming in Metadata [3]. ASP.NET accommodates a wide variety of browsers and devices. By default, controls render output that is compatible with XHTML 1.1 standards. You can use device filtering to specify different property values on the same control for different browsers.

C. .NET Remoting


D. XML

The new System.Xml.XmlReaderSettings class allows specification of the type of verifications to be done when using a subclass of XmlReader to read XML data. It is now possible to partially validate a DOM tree loaded within an instance of XmlDocument. It is now possible to modify a
DOM tree stored in an XmlDocument instance through the XPathNavigator cursor API.

III. NET FRAMEWORK 3.0/3.5 FEATURES

A. Windows Presentation Foundation (WPF)

Windows Presentation Foundation (WPF) is a next-generation presentation system for building Windows client applications. The core of WPF is a resolution-independent and vector-based rendering engine that is built to take advantage of modern graphics hardware.

WPF extends the core with a comprehensive set of application-development features that include Extensible Application Markup Language (XAML), controls, data binding, layout, 2-D and 3-D graphics, animation, styles, templates, documents, media, text, and typography. WPF is included in the Microsoft .NET Framework, so you can build applications that incorporate other elements of the .NET Framework class library.

To support some of the more powerful WPF capabilities and to simplify the programming experience, WPF includes additional programming constructs that enhance properties and events: dependency properties and routed events.

B. Windows Communication Foundation (WCF)

Windows Communication Foundation (WCF) is Microsoft’s unified programming model for building service-oriented applications. WCF allows you to build many kinds of distributed applications including “traditional” Web Services so that your services support SOAP and will therefore be compatible with other .NET (and other) technologies. WCF is not just about pure SOAP over the wire - you can work with an Info set, and create a binary representation of your SOAP message that can then be sent along with your choice of protocol. This is for those who are particularly concerned about performance and have traditionally turned to .NET remoting.

C. Windows Workflow Foundation (WWF)

Windows Workflow Foundation, a core component of .NET Framework 3.0, provides a programming model, run-time engine, and tools for building workflow applications.

A workflow is created and maintained by the workflow runtime engine. There can be several workflow engines within an application domain, and each workflow engine can support multiple workflows running concurrently. The runtime enables idle workflows to be unloaded from memory, persisted to a store, and reloaded whenever input is received. Workflows can be authored in code, XAML markup, or a combination of both, known as code-separation, which is similar to the ASP.NET mode.

D. Windows CardSpace (WCS)

Windows CardSpace (InfoCard) is a Digital Identity to online services. Digital Identity is how a user will be electronically represented. Such as for a debit/credit card, each card has a digital identity and password. If any user uses the site on internet then he enters their username and password, for identity, but this is not secure. WCS reduces these types of problems.

WCS (originally called Info Card) helps people keep track of their digital identities as distinct information cards. If a Web site accepts WCS logins, users attempting to log in to that site will see a WCS selection. By choosing a card, users also choose a digital identity that will be used to access this site. CardSpace and the new supporting technologies will change how you authenticate into an application, whether it sits on the Web, your phone, or your desktop.

E. Core New Features and Improvements

Some core new features and improvements are implemented in .Net 3.0/3.5; they are:
1. Auto Implemented Property
2. Implicit Typed local variable
3. Implicitly Typed Arrays
4. Anonymous Types
5. Extension Methods (3.5 new feature)
6. Object and Collection Initializers
7. Lambda Expressions

IV. NET FRAMEWORK 4.0 FEATURES

A. Application Compatibility and Deployment

The .NET Framework 4 is highly compatible with applications that are built with earlier .NET Framework versions, except for some changes that were made to improve security, standards compliance, correctness, reliability, and performance.

The .NET Framework 4 does not automatically use its version of the common language runtime to run applications that are built with earlier versions of the .NET Framework. To run older applications with .NET Framework 4, you must compile your application with the target .NET Framework version specified in the properties for your project in Visual Studio, or you can specify the supported runtime with the <supportedRuntime> Element in an application configuration file.

B. Core New Features and Improvements

Some new features are introduced in .Net framework 4.0.

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

1. BigInteger and Complex Numbers
2. Tuples
3. Covariance and Contravariance
4. Dynamic Language Runtime

C. Managed Extensibility Framework

The Managed Extensibility Framework (MEF) is a new library in the .NET Framework 4 that helps you build extensible and composable applications. MEF enables you to specify points where an application can be extended, to expose services to offer to other extensible applications and to create parts for consumption by extensible applications. It also enables easy discoverability of available parts based on metadata, without the need to load the assemblies for the parts.
D. Parallel Computing

The .NET Framework 4 introduces a new programming model for writing multithreaded and asynchronous code that greatly simplifies the work of application and library developers. The new model enables developers to write efficient, fine-grained, and scalable parallel code in a natural idiomatic without having to work directly with threads or the thread pool. The new System Threading Tasks namespace and other related types support this new model.

E. Web

ASP.NET version 4 introduces new features in the following areas:

- Core services, including a new API that lets you extend caching, support for compression for session-state data, and a new application preload manager (autostart feature).
- Web Forms, including more integrated support for ASP.NET routing, enhanced support for Web standards, updated browser support, new features for data controls, and new features for view state management.
- Web Forms controls, including a new Chart control.
- MVC, including new helper methods for views, support for partitioned MVC applications, and asynchronous controllers.
- Dynamic Data, including support for existing Web applications, support for many-to-many relationships and inheritance, new field templates and attributes, and enhanced data filtering.
- Microsoft Ajax, including additional support for client-based Ajax applications in the Microsoft Ajax Library.
- Visual Web Developer, including improved IntelliSense for JScript, new auto-complete snippets for HTML and ASP.NET markup, and enhanced CSS compatibility.
- Deployment, including new tools for automating typical deployment tasks.
- Multi-targeting, including better filtering for features that are not available in the target version of the .NET Framework.

V. NET FRAMEWORK 4.5 FEATURES

A. .NET for Windows Store Apps

Windows Store apps are designed for specific form factors and leverage the power of the Windows operating system. A subset of the .NET Framework 4.5 is available for building Windows Store apps for Windows by using C# or Visual Basic.

B. Portable Class Libraries

The Portable Class Library project in Visual Studio 2012 enables you to write and build managed assemblies that work on multiple .NET Framework platforms. Using a Portable Class Library project, you choose the platforms (such as Windows Phone and .NET for Windows Store apps) to target.

C. Windows Presentation Foundation (WPF) Features in 4.5

In the .NET Framework 4.5, Windows Presentation Foundation (WPF) contains changes and improvements in the following areas:

- The new Ribbon control, which enables you to implement a ribbon user interface that hosts a Quick Access Toolbar, Application Menu, and tabs.
- The new INotifyDataErrorInfo interface, which supports synchronous and asynchronous data validation.
- New features for the VirtualizingPanel and Dispatcher classes.
- Improved performance when displaying large sets of grouped data, and by accessing collections on non-UI threads.

D. Windows Workflow Foundation (WF) Features in 4.5

Several new features have been added to Windows Workflow Foundation (WF) in the .NET Framework 4.5. These new features include:

- State machine workflows, which were first introduced as part of the .NET Framework 4.0.1 (.NET Framework 4 Platform Update 1). This update included several new classes and activities that enabled developers to create state machine workflows. These classes and activities were updated for the .NET Framework 4.5 to include:
  - The ability to set breakpoints on states.
  - The ability to copy and paste transitions in the workflow designer.
  - Designer support for shared trigger transition creation.

E. ASP.NET 4.5

ASP.NET 4.5 includes the following new features:

- Support for new HTML5 form types.
- Support for model binders in Web Forms. These let you bind data controls directly to data-access methods, and automatically convert user input to and from .NET Framework data types.
- Support for unobtrusive JavaScript in client-side validation scripts.
- Improved handling of client script through bundling and minification for improved page performance.
- Integrated encoding routines from the AntiXSS library (previously an external library) to protect from cross-site scripting attacks.
- Support for WebSockets protocol.

CONCLUSIONS

Finally we conclude that releasing of different versions of .Net framework will never stop as world is developing very fast everybody wants changes as per their requirements for new ideas to be implement and change is beginning of releasing of new versions.

REFERENCES

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