IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 6, June 2015.
www.ijiset.com
ISSN 2348 – 7968

XNA Gaming Framework and Comparative Analysis

Veenus Chhabra

M.Tech Student Department of CSE, NGF College of Engineering & Technology, Palwal, Haryana ,India
8860535618 chhabravenus@gmail.com

Kuldeep Tomar
Department of CSE, NGF College of Engineering & Technology, Palwal, Haryana,India
09811396632

Abstract

Today, all over the world, mobile phones and its usage are growing at a faster rate. Specially, smartphones, iPods, iPads. People are more attracted towards these devices. They love to live with these devices, as it is also the status symbol. One of the interesting features of these devices is that they don't allow users to get bored in their free time or when they are out of work. They have many interesting features. They have the capability to load the games into them. Gaming is an area where every person engages itself whether being a child, young or old aged person. Microsoft also shared the mobile market for same reason also. In Microsoft Winphones, gaming is done using XNA framework. In this paper there is a description about XNA, it's different version releases and a comparative analysis of those versions.

Keywords

Games, Microsoft, XNA framework, XNA build, XNA Game studio, XNA versions, Game Engine, Graphics, Multimedia, Comparative Analysis.

Introduction

After seeing the people addiction towards Gaming and that too on phones, led every company and developers to think for more effort and develop more games for phone. Microsoft took the initiative to provide this very feature for Windows market.

Not only this, but one more thing has to be kept in mind while developing games is that their attractiveness and effectiveness of games.

This is possible only if we have some dynamic gaming environment with easy loading of games. This also includes special 3-D effects, faster image loading, sprites loading, animations and multimedia effects.

Combining the above two reasons, need arose to build games for Winphones, and so Microsoft came up with gaming toolset or framework to easily develop games.

As large amount of time and coding is required to create games and their implementation on large scale with the help of smallscale development teams or individuals is quite different.

Microsoft XNA framework is one such toolset that was designed to reduce the workload for programmers to easily develop complex games for use with various platforms of Microsoft.

XNA

Based on .NET framework, XNA is a freeware set of tools that helps in game development and management. It is provided by Microsoft. At Game Developers conference held on March 24'2004, XNA toolset was first announced, and, the first release of XNA build was held at March 14'2006.

XNA framework consists of code libraries and programs APIs to reduce the amount of coding required for common related tasks. The main aim of XNA has been to allow programs more on coding rather than on creating game engine and graphics.

XNA makes multiplayer game development easier with custom managed code libraries and structure Xbox Live support and games.

Goals of XNA

There are two main aim of XNA. These are as follow:

1. Enabling Cross Platform Game Development
2. Simplifying Game Development.

Cross Platform Game Development:

XNA has the ability to make code independent of platforms. Specially the two, Microsoft and Xbox360.

XNA provide APIs to build code irrespective of semantics. They normalize the code upto 95%. Although there may be situations that some part of code or features are effective for one of the platforms and not for others. So there is need to differentiate code but not the whole part, there is code redundancy. This feature enables user to develop games easily for Windows and then creating its Xbox version.

Simplified Game Development:
Developing games means writing large amount of code and testing along with error fixing. It requires continuous efforts involved.
For programmers it takes a lot of time to write the code, while maintaining its functionality and features. But if coder are students or hobbyist then, this is going to be very difficult. They are not programmers who know how to do gaming codes exactly so XNA tool is a help to them & also to all type of coders. With the help of XNA framework inbuilt in code, there is no need to write extra codes for calling sprites, 3D graphics, animation and other feature such as audios/videos/multimedia.
So, if the main aim is to write logic of game then coder should be allowed to that only rather being writing enumerators, graphics, adaptors or display modes. There will not any need to create Direct3D 9 device or managing it even if Windows is resized or game is minimized.

3.1 Content Pipeline

As XNA is helpful in making your game development easier by putting the content into the game and making it's runtime consumption easier. This is knows as "Content Pipeline", which takes care of importing, then compiling and loading of the content.

The Content Pipeline is a special set of assemblies that takes into account the use of MSBuild to compile game assets like image and sound files into streamlined, pre-processed binary files called XNBs which gets loaded at run time quickly. The Content Pipeline has its availability only on Windows and due to its availability on MSBuild, it requires full the full .NET Framework 4.0 for XNA 4.0 and full .NET Framework 2.0 for earlier versions of XNA.

As Content Pipeline exist while run time, it may not be present at targeted time, XNB files are loaded using Content Manager and inbuilt helper classes without the help of Content Pipeline assemblies. XNB files are platform-specific. Both XNA Framework Redistributable and the XNA Framework EULA does not permit the distribution of the Content Pipeline assemblies unless included with XNA Game Studio.

Layers

XNA has a series of layers. It is worthful to describe about them while discussing about its framework.There are mainly 4 layers .

1. Platform
2. Core Framework
3. Extended Framework
4. Games

Platform: It is the lowest layer of framework and contains low level managed APIs such as Direct3D 9, XACT, XInput, and XContent on which XNA is built.

Core Framework: It is XNA Framework's "first" layer that provides the core functionalities that are extended by other layers. It helps to associate something with Managed DirectX. Functionalities that are found here are clustered into Graphics, Audio, Input, Math, and Storage. This layer also helps to provide other additional functionalities.

Extended Framework: It's main aim is to make game development easier. This layer has two main parts namely- the Application Model and the Content Pipeline that may get extended to make it even easier for writing games and expanding the target audience.

Games: It is the highest layer of frameworkconsisting of game code and content like Starter Kits, templates, and game components.

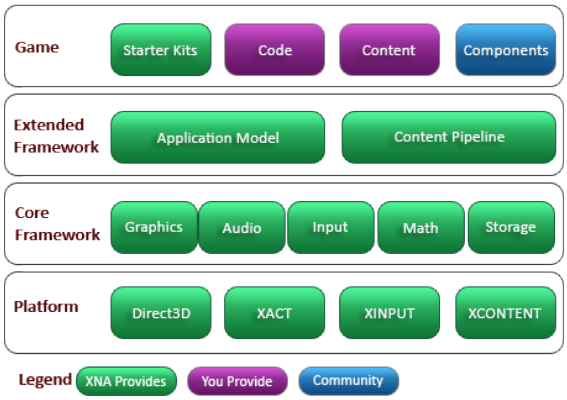

Figure 1: XNA framework

Features

The XNA have many features that are provided to coders and are helpful. These may be:

Application Model: It's purpose is to make game development easy by providing Graphics Component that also manages a Graphics Device which is used for rendering. It also helps in integrating Game Component into your code that are specifically written by others. It helps to build libraries having reusable components without being bothered about message pump handling, creating a window, timer or clock or even wondows message handling.

Graphics: The Graphics APIs are based on the Direct3D 9 APIs. They are easier to use and more consistent with the .NET Design Guidelines. It has support for fixed-function pipeline and all shader-driven programmable pipeline.

The reasons to give such support is because-

1. programmable pipeline is the future of real-time computer graphics.
2. cross-platform goal of th.e XNA Framework is more valuable than the fixed-function pipeline

Audio: The Audio APIs are developed on XACT, the audio API for Microsoft cross-platforms Windows and the Xbox 360 . There was similar idea behind XACT as shaders in Direct3D. The XACT tool is used to create "packages" for sound effects and configure volume, looping, channel mixing, etc.

Input: It offers an immediate mode API that requires no initialization and it is built on cross-platform API, XInput, driving the common controller (Xbox 360 Controller). There is no need to set sharing mode or acquiring or releasing device. The only requirement is to call GetState on the appropriate controller. A GamePad type and Keyboard type are provided for both platforms and a Mouse type for Windows.

Storage: The Storage APIs are also provided to save games state, high scores, etc. in a platform neutral manner. System.IO and the Environment methods are provided that allow to store content at the correct location after association of game state with a profile and a storage device, such as the hard drive or a memory unit.

Math: The Math API provides the types such as Vector2, Vector3,Vector4, Matrix, Plane and Ray that are used in game programming. BoundingBox, BoundingSphere and BoundingFrustum are also provided. If used the coordinate system, then it becomes more easy to use content or APIs from outside of the XNA Framework.

Game Studio

XNA Framework is easily available through Game Studio, a package that allows creation of complete games within its programming environment. There is no need to have separate compilers for coding, compiling and testing. From 2012, there have been five XNA Game Studio releases, of which XNA Game Studio 4.0 Refresh is most recent that incorporated bug fixes and support for cross-platform for both Windows Phone 7.5 and the Visual Basic programming language.

Different XNA and Game Studio Versions

There had many releases of XNA with integration of Game Studio to get provided with essential tools and built in libraries for game development. With every XNA framework version there is release of new Game Studio version. These are:

XNA Framework	XNA Game Studio	Features
Microsoft XNA Framework Redistributable 1.0 Refresh	Microsoft XNA Game Studio 1.0 Refresh	• Audio, • Video, • Multimedia, • Animations and • graphics toolkit.
Microsoft XNA Framework 2.0	Microsoft XNA Game Studio 2.0	• Expanded support for Visual Studio 2005 • Networking • Multiplayer support • Easy Xbox360 connectivity • Improved content pipeline
Microsoft XNA Framework 3.0	Microsoft XNA Game Studio 3.0	• Expanded support for Visual Studio 2008 • Development using Microsoft Zune digital media player • Enhanced Media support API • Enhanced sound effects • Rich presence, etc.

Microsoft XNA Framework Redistributable 3.1	Microsoft XNA Game Studio 3.1	• Avatars • Xbox LIVE Party Support • Enhanced video quality • Improvisation in existing features.
Microsoft XNA Framework Redistributable 4.0	Microsoft XNA Game Studio 4.0	• Visual Studio 2010. • .NET framework 4
Microsoft XNA Framework Redistributable 4.0 Refresh	Microsoft XNA Game Studio 4.0 Refresh	• Updates in Game Studio 4.0 • Bug fixes • Development Visual Basic • Windows Phone 7.1 OS targeted.

XNA Release and Requirements

Version No:	File Name	Release Date	File size (MB)	System requirements
1.0	XNA Game Studio Express .zip xnagse_setup.msi	07/03/2007 24/04/2007	2.6 82.3	**1**. Windows XP Service Pack2
2.0	XNAGS20_setup.exe xnafx20_redist.msi	13/12/2007 13/12/2007	98.6 2.1	**1**. Windows Vista **2**. Windows XP Service Pack2 **3**. .NET framework **4**. Shader Model 1.1
3.0	XNAGS30_setup.exe Xnafx30_redist.msi	30/10/2008 30/10/2008	62.5 7.6	**1**. Windows Vista Service Pack1 **2**. Windows XP Service Pack3 **3**. Graphic card supporting DirectX 9.0c **4**. Shader Model 1.1 **5**. Zune 3.0 firmware
3.1	XNAGS31_setup.exe xnafx31_redist.msi	11/06/2009 11/06/2009	73.2 7.3	**1**. Windows Vista Service Pack1 **2**. Windows XP Service Pack3 **3**. Graphic card supporting DirectX 9.0 **4**. Shader Model 1.1 **5**. Shader Model 2.0 **6**. Zune 3.0 firmware
4.0	XNAGS40_setup.exe Xnafx40_redist.msi	16/09/2010 16/09/2010	48.8 6.7	**1.** Windows7 **2**. Windows Vista **3**. WindowsXP **4**. Graphic card supporting DirectX 9.0 **5**. Shader Model 1.1 **6**. Shader Model 2.0
4.0 Refresh	XNAGS40_setup.exe Xnafx40_redist.msi	16/10/2011 16/10/2011	40.8 6.7	**1.** Windows7 **2**. WindowsXP **3**. Graphic card supporting DirectX 9.0c **4**. Shader Model 1.1 **5**. Shader Model 2.0

Conclusion

From above we can see that there had been great market rush for game development and so Microsoft has put an effort in gaming market by providing easy game development kit to coders named “XNA” with different releases giving easy multimedia support, audio, videos, animation, sprites. This lead game development easy thus saving time of many users from writing these complex APIs for game as XNA has inbuilt libraries and API kit.

References

[1] http://en.wikipedia.org/wiki/Microsoft_XNA

[2]http://blogs.msdn.com/b/xna/archive/2006/08/25/what-is-the-xna-framework.aspx

[3] http://xboxforums.create.msdn.com/forums/t/1988.aspx

[4] http://www.microsoft.com/en-in/download/details.aspx?id=25279

[5] http://www.microsoft.com/en-in/download/details.aspx?id=2431

[6] http://www.microsoft.com/en-in/download/details.aspx?id=15537

[7] http://www.microsoft.com/en-in/download/details.aspx?id=3038

[8] https://www.microsoft.com/en-in/download/details.aspx?id=22588&751be11f-ede8-5a0c-058c-2ee190a24fa6=True

[9] https://www.microsoft.com/en-in/download/details.aspx?id=15300

[10] http://www.microsoft.com/en-in/download/details.aspx?id=15163

[11] http://www.microsoft.com/en-in/download/details.aspx?id=39

[12] http://www.microsoft.com/en-in/download/details.aspx?id=23714

[13] http://www.microsoft.com/en-in/download/details.aspx?id=27599

[14] http://www.microsoft.com/en-in/download/details.aspx?id=27598

[15] http://www.microsoft.com/en-in/download/details.aspx?id=20914

[16]http://blogs.msdn.com/b/astebner/archive/2012/02/29/10274694.aspx

[17]http://social.technet.microsoft.com/wiki/contents/articles/2232.xna-framework-overview.aspx

[18]http://yourbusiness.azcentral.com/microsoft-xna-framework-20700.html

[19]http://what-when-how.com/xna-game-studio-4-0-programmingdeveloping-for-windows-phone-7-and-xbox-360/a-brief-history-of-xna-game-studio