Application Platform Overview for Windows Phone 7 Series

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Contents

Application Platform Overview for Windows Phone

Windows Phone Application Platform is a new application platform focused on supporting consumer entertainment experiences running on Windows® Phone OS 7.0 CTP. It is built upon Microsoft® technologies such as Silverlight®, XNA Framework® and the .NET Compact Framework. Developers already familiar with those technologies and their related tools will be able to create new applications for Windows Phone OS 7.0 CTP without a steep learning curve. This topic includes the following sections:

Overview

Two frameworks are available for developing applications:

1. *A Silverlight UI framework for event-driven, XAML-based application development* - Windows Phone Application Platform provides developers with the full richness of Silverlight to develop creative mark-up based user experiences.
2. *An XNA UI framework for loop-based games* – Windows Phone Application Platform provides developers with the full power of the XNA Framework gaming environment, enabling immersive and fun gaming and entertainment experiences.

The end-to-end Windows Phone Application Platform development environment includes Visual Studio®, Expression Blend®, Windows Phone Marketplace services, cloud-based Web services, and developer co-marketing and evangelism programs.

The Windows Phone OS 7.0 CTP user experience is designed to put the focus on consumers and the information and experiences they care about. The consumer's data and information should be personal, relevant, and connected.

To help developers create applications for these consumers, Windows Phone Application Platform provides:

- An easy and inexpensive way for developers to get started.
- A cohesive and well designed managed API set.
- A service-based application deployment marketplace to distribute their application.
- An isolated sandbox on the device that every application runs in.
- Runtime services on devices that can be used to access Web services in the cloud such as Xbox LIVE®, Windows Azure™, and notification services. Access to 3rd party services, such as storage, identity, and social networking, are also supported.

Windows Phone Application Platform, like most platforms, will continue to evolve over time but its goal will always be to deliver:

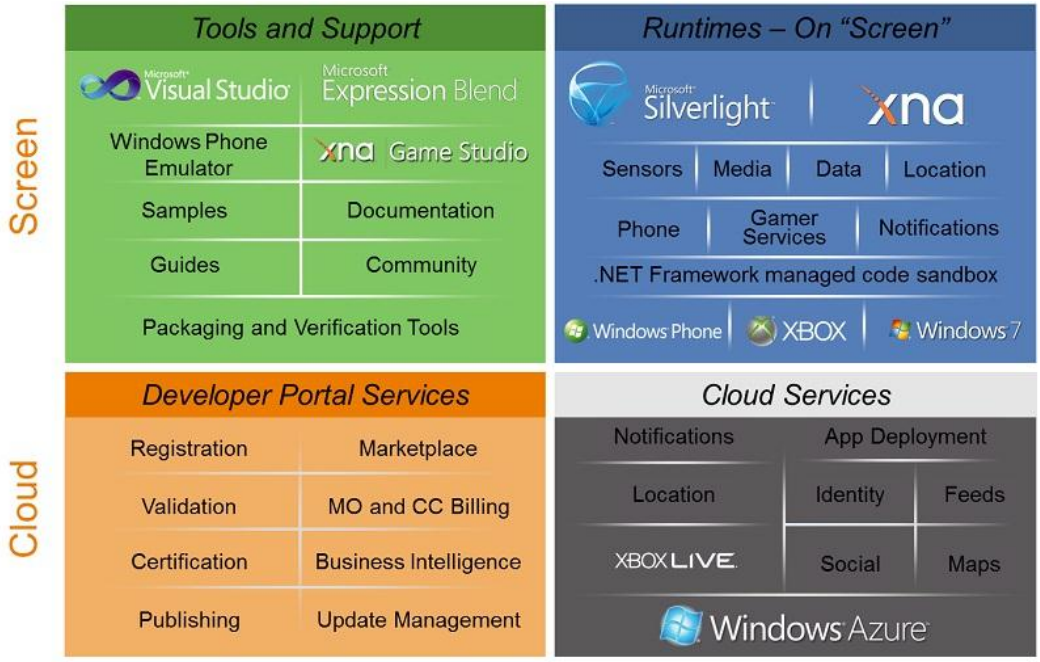
- Richer applications, developed for a highly standardized platform.
- Support for personal and connected consumer data across multiple devices.
- A robust application marketplace and developer portal for complete end-to-end lifecycle management.
- Powerful and productive development tools.

This platform is designed to support the 3 Screens + the cloud world that consumers live in.

The 3 Screens + the cloud concept covers all the screens and devices consumers are using, all equally important and all tied together by the cloud which connects all the relevant information together, providing users with all the information they need as they move from device to device. Common user experiences make it easy to move between devices and a common development platform makes it easy to develop applications for all the device types.

Architecture

The Windows Phone Application Platform architecture is made up of four main components.



1. Tools and Support – Visual Studio 2010 and Expression Blend, along with their related tools and documentation, create a complete developer experience for quickly creating, deploying and updating applications.
2. Runtimes-On "Screen" – Silverlight, XNA Framework, .NET Compact Framework and their related services provide a mature environment on which to build secure, graphically-rich applications.
3. Developer Portal Services – The Windows Phone Marketplace provide robust services that allow developers to register, certify, and market their applications.
4. Cloud Services – Windows Azure, Xbox LIVE Services, along with a variety of other Web services allow developers to share data across the cloud and benefits consumers by providing a seamless experience across whatever device they are using. Connections to 3rd party Web services are also fully supported.

Tools and Support

Developers can download and install a single package that includes all the tools, documentation, and samples that they need to start developing applications for Windows Phone OS 7.0 CTP.

If Visual Studio is not already present, Visual Studio 2010 Express for Windows Phone CTP will be installed.

If Visual Studio is present, an add-in to Visual Studio will be installed, along with Visual Studio 2010 Express for Windows Phone CTP. Developers can then choose which tool they prefer to use.

Visual Studio 2010

Visual Studio is the IDE for building Windows Phone OS 7.0 CTP applications. Within the Visual Studio IDE, developers can create Silverlight or XNA Framework programs that run on Windows Phone OS 7.0 CTP. Visual Studio includes a project system, packager, manifest generation, designer and a debugger.

Expression Blend

In the same way that designers use Expression Blend to design Rich Internet Applications for the desktop browser, they can also design creative and unique applications for Silverlight-based applications on Windows Phone OS 7.0 CTP. Expression Blend allows designers to create XAML-based interfaces whose behaviors can then be implemented by developers in Visual Studio.

Windows Phone Emulator

A Windows Phone Emulator is integrated into Visual Studio to make testing and debugging of the applications easier and more efficient. The emulator fully supports application deployment, debugging, and application execution. It includes support for GPU emulation, GPS simulation, orientation, and phone “skinning.”

XNA Game Studio

Microsoft XNA Game Studio is a set of tools that developers can use to build fun and exciting games for Microsoft Windows®, the Microsoft Xbox 360® video game and entertainment system, Microsoft Zune® and Windows Phone OS 7.0 CTP. The 2D and 3D managed code libraries radically lower barriers of entry in high quality game development. XNA Game Studio also includes the XNA Framework, which is a set of managed libraries that are designed for game development.

Samples, Documentation, Guides and Community

Documentation, How-to Guides, sample code, and applications will be provided to aid developers ramping up on Windows Phone OS 7.0 CTP development. Forums, blogs, and Web sites will be available for developers to ask questions and share information with the greater Windows Phone OS 7.0 CTP community. The new Visual Studio Help system will allow developers to continuously update their documentation sets.

Runtimes On "Screen"

Windows Phone Application Platform supports the two predominant client application styles: markup-based, event-driven applications created with Silverlight and loop-based programs, such as games, created with XNA Game Studio. All development is done in managed code, in a protected sandbox allowing for rapid development of safe and secure applications. Applications written for Silverlight or XNA Framework today will run on Windows Phone OS 7.0 CTP with only a minor number of adjustments, such as for screen size or for device specific sensors.

Silverlight and the .NET Framework

Microsoft Silverlight is a cross-browser, cross-platform implementation of the .NET Framework for building media experiences and rich interactive applications. Silverlight for Windows Phone includes the Microsoft .NET Compact Framework. The .NET Compact Framework supports the building and running of managed applications on resource-constrained computing devices. The .NET Compact Framework inherits the full .NET Framework architecture of the common language runtime and managed code execution, supports a subset of the .NET Framework class library, and contains classes designed exclusively for the .NET Compact Framework. This support includes the Base Class Library, a collection of classes that support file reading and writing, string manipulation, XML manipulation, and graphics handling. Each application that is running on Windows Phone OS 7.0 CTP executes inside a host process that is based on the .NET Compact Framework runtime. Access to platform functionality is provided exclusively through the Windows Phone Application Platform frameworks.

XNA Framework

Microsoft XNA Framework is composed of industry-leading software, services, and resources focused on enabling game developers to be successful on Microsoft gaming platforms. Microsoft provides advanced technology that allows professional developers to quickly enable games on platforms like Windows Phone OS 7.0 CTP Xbox 360, Zune HD, Windows 7 and Windows Phone OS 7.0 CTP. The XNA Framework provides a complete set of managed APIs for game development. This includes 2D sprite-based APIs that support rotation, scaling, stretching and filtering as well as 3D graphics APIs for 3D geometry, textures, and standard lighting and shading.

Sensors

A variety of sensors will return data that can be consumed by developers. For example, multi-touch input, accelerometer, and microphone sensors will all be accessible by APIs.

Media

Silverlight and the XNA Framework provide developers with a unified programming model for building rich user experiences that incorporate graphics, animation, and media. The managed APIs support a variety of media formats and allow for discovery and enumeration of media on the device and for playback of that media.

Data

Isolated Storage allows an application to create and maintain data in a sandboxed isolated virtual folder. All I/O operations are restricted to isolated storage and do not have direct access to the underlying operating system file system. This prevents unauthorized access and data corruption by other applications.

Location

The Location services will easily allow application developers to access the user's physical location information from a single API. Developers can query for the current location, subscribe to Location Changed events, set the desired accuracy of the data, get access to the device heading and speed, and calculate the distance between points. The Location APIs on the phone will work in conjunction with the Location services in the cloud.

Developer Portal Services

The Windows Phone Marketplace provides a centralized location for developers to submit and certify their applications. Consumers have a centralized location from which to buy or update their applications.

Registration and Validation

Developers can get started on the Developer Portal by signing up with their Live ID. After registration is complete, developers can get all the needed tools in a single download.

Certification, Publishing, and Update Management

A set of tools will help the developer to submit and certify their applications for the Windows Phone Marketplace. Applications are submitted in a .XAP file format, which is essentially one compressed file that contains all the files that are needed by the application. Developers can track their submission status and then receive a notification once the certification is complete. After an application is certified, it can then be submitted for publishing on the Windows Phone Marketplace. Developers can set pricing and select the markets in which they wish to publish the application.

Application updates can go through the certification and publishing process again in order to fix bugs, add new functionality, or provide whole new versions.

Windows Phone Marketplace and Billing

The Windows Phone Marketplace provides the one place where developers can make their applications available for purchase by consumers. Both Mobile Operator and credit card billing are supported, making it as easy as possible for consumers to pay for the program.

Business Intelligence

Business intelligence tools will provide developers with information about how their application is being used, monetary and sales reports, feedback from users, and debugging information reported by their applications.

Cloud Services

The Windows Phone Application Platform provides many features for building compelling Web-integrated applications. Services built on Azure or 3rd party Web services can be accessed to bring data to the phone. The Windows Phone Marketplace provides a means for developers to certify and distribute their applications to consumers.

Notifications

To enable efficient, dynamic and up-to-date information and communication channels, Windows Phone Application Platform provides a client API to access cloud-based services that enable applications to be notified when relevant events occur. This eliminates the need for polling and reduces battery consumption.

Location

The Location Service will work together with the Location APIs on the phone, making its presence transparent to the developer. The service will use Wi-Fi, Cellular, and GPS data to provide a single source for providing position lookup. Assisted GPS (AGPS) is available to improve the fix for GPS.

Identity, Feeds, Social, and Maps Services

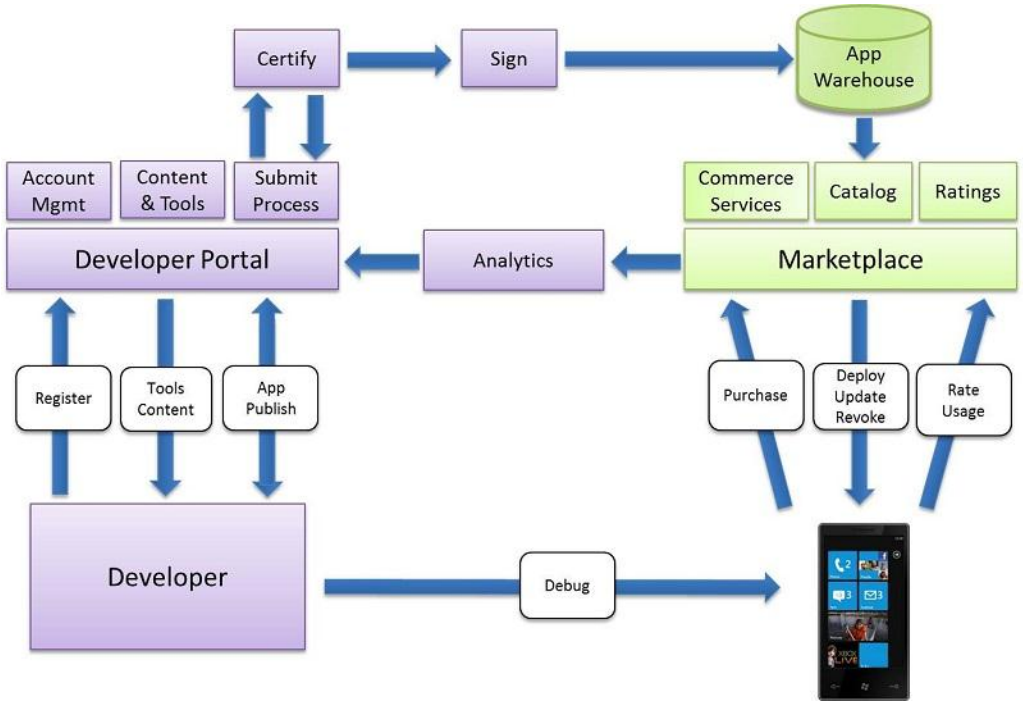
The extensive variety of Web services in the cloud allow consumers to identify themselves, interact with social communities, receive data feeds, and use maps for navigation. Developers can enrich this experience by providing new applications that utilize these services.

Azure

Visual Studio 2010 provides the development environment for creating applications using the Windows Azure™ Platform, an Internet-scale cloud computing and services platform hosted in Microsoft data centers. The Windows Azure Platform provides a range of functionality to build applications that span from consumer Web to enterprise scenarios and includes a cloud operating system and a set of developer services. Fully interoperable through the support of industry standards and Web protocols such as Representational State Transfer REST and Simple Object Access Protocol (SOAP), you can use the Azure services individually or together, either to build new applications or to extend existing ones.

The Application Development Lifecycle

This section describes how developers can use the Windows Phone Application Platform from the beginning to the end of the development cycle.



Getting Started With the Windows Phone Developer Portal

The Windows Phone Developer Portal will be the starting point for developers. Developers can begin working with Windows Phone Application Platform by signing up for a Windows Live ID. Next, they can sign up to obtain the developer tools and associated licensing materials for developing applications using Visual Studio 2010 and Expression Blend. This will be a single download that contains everything the developer requires for building an application for Windows Phone OS 7.0 CTP. Developers can also register one or more phones for use as test hardware in validating the applications that they are building. Any retail Windows Phone OS 7.0 CTP phone can be registered as a test device.

The Windows Phone Developer Portal contains samples, documentation, and active developer communities that help make Windows Phone OS 7.0 CTP developers successful.

Designing an Application and Producing an Application Package

Once developers have signed up to be a Windows Phone OS 7.0 CTP developer and have installed the developer tools, they can begin developing their applications.

Games and graphics intensive applications are created in Visual Studio 2010 using the 2D and 3D libraries of the XNA Framework.

The visual design for XAML-based applications for Silverlight is created in Visual Studio 2010 and/or Expression Blend. The resulting XAML document containing markup is then interpreted by the Silverlight presentation engine and other components of the Windows Phone Application Platform.

The Visual Studio IDE is used to write managed code defining the visual behavior of all Windows Phone OS 7.0 CTP applications. When the application is completed, a package is created that includes everything needed by the application.

Debugging an Application

While creating a Windows Phone OS 7.0 CTP application, a developer can debug the program on a phone or in a software emulator. Debugging the application involves creating a package targeted to the debugging platform and then using Visual Studio 2010 to deploy the package. Call stack walking, expression evaluation, source code stepping, and variable watch windows are all supported.

Publishing an Application

Once an application has been completed, a developer can make the program available to other users on the Windows Phone Marketplace. To publish to the Windows Phone Marketplace, developers first need to create a .xap file. The .xap file is a compressed file containing all the information needed by the application. This includes an application icon, a start tile, metadata, and licensing terms that determine how their program can be used.

Next, the developer signs into the developer portal and submits the application package for certification. This is the only way to make an application available to consumers. The certification process will verify that the application is well behaved, works for the languages and markets indicated, and does not adversely affect the overall health of the phone.

Once the package has satisfied the Windows Phone Marketplace certification requirements, the developer is notified and can publish the application to the Windows Phone Marketplace through the developer portal. Applications are then made available for consumers to download in the Windows Phone Marketplace. Credit card and mobile-operator billing operations are supported.

Managing Published Applications

After a Windows Phone OS 7.0 CTP application has been published to the Windows Phone Marketplace, the developer uses the developer portal to manage the versions of the application that are available for purchase, as well as add-ons to the application. The portal also provides tools for reviewing feedback from users, as well as for analyzing revenue, usage and performance data.