Microsoft® Windows®xp

Operating System

Windows XP and .NET: An Overview

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Abstract

This paper presents an overview of the Windows® XP operating system in the Microsoft® .NET platform. It explains XML-enabled Web services included in Windows XP today and shows potential Web services that may become available in the future.

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Acknowledgements

Introduction

The release of Windows® XP comes at a time of transition and growing maturity of the Internet.

The Web has grown to include many millions of sites on almost every conceivable topic. Although more information is available than ever before, the opportunities to fully manage and customize it have remained limited. Until now.

The Microsoft® .NET initiative aims to turn this around through a framework built around XML-based Web services that interoperate via existing open Internet protocols such as TCP/IP and HTTP.

And at the heart of the .NET platform for knowledge workers, business users, and consumers lies the new client operating system, Windows XP.

The successor to Windows 2000 Professional and Windows Millennium is designed to serve as the central information hub for services and act as the smartest of all devices amid a growing constellation of Pocket PCs, mobile phones, Tablet PCs, digital cameras, and other devices.

Buildup to the .NET platform

A lot has changed since the computing experience was safely contained within the walls of organizations. Computing has advanced from the stand-alone PC to the Local Area Network and the Internet.

Now employees may be located across the globe. They need to interact with partners, suppliers, and customers, using the Internet as a connectivity medium.

The challenge: getting applications to talk to other applications

Having a ubiquitous set of simple standards for connectivity was essential to the success of the Internet. These standards such as TCP/IP were broadly acceptable, ready to use, and very decentralized. But although the Web has revolutionized the way users talk to applications, it's done very little for how applications talk to applications. The .NET initiative aims to change that.

The solution: XML Web services

XML Web services allow applications to communicate and share data over the Internet, regardless of operating system or programming language. It is this simple premise that drives the .NET platform and underlies how Windows XP sits at the center of your data and information.

The .NET Framework

The programmatic backbone of this emerging platform is called the .NET Framework. It is the culmination of several years of research and development aimed at simplifying the process of building, deploying, and maintaining applications. Development of the framework is the result of various trends including:

- **Distributed Computing.** The need to simplify application development through a remoting architecture based on open standards such as HTTP, XML, and SOAP.

- **Componentization.** The need to simplify the integration of components so that they can be more easily reused, developed, and deployed in mixed environments that require interoperability.

- **Maturity factors.** Development of large scale Web applications has resulted in the need for Web services that support availability, manageability, scalability, and interoperability.

- **Enterprise services.** The need to develop scalable enterprise applications without having to write extra code for security, managed transactions, or pooling.

What's in the .NET Platform

Windows XP is an essential piece of the .NET platform and takes its place alongside other client devices as shown in Figure 1 below.
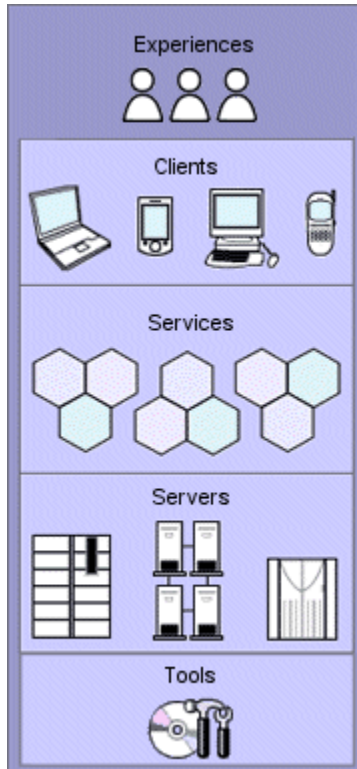
Figure 1. Windows XP and the .NET platform

.NET Experiences

.NET experiences represent a dramatically more personal, integrated computing experience. Using connected XML Web Services, .NET experiences are centered around the user, integrating their data and preferences with a range of services into a unified, personalized experience—all delivered through a smart device.

Microsoft will deliver user experiences for knowledge workers, consumers, enterprises, small businesses, and developers. Some products that will become .NET experiences are future versions of Microsoft Office, MSN® Internet access, bCentral™ small business portal, and Visual Studio® .NET. These .NET experiences will pull together XML Web services and client software to meet specific user needs presented in an integrated way.

Clients

Powerful client software such as the .NET compact framework, Windows CE, and Windows XP enable a host of smart devices—PCs, laptops, workstations, phones, handheld computers, Tablet PCs, game consoles, and other devices to operate in the .NET universe. Through the use of this software, smart devices harness the

power of the Internet providing you with a compelling and immersive experience while giving you more control over their information.

Services

In addition to developer creation of XML Web services, Microsoft is creating a core set of building block services that perform routine tasks and act as the backbone for developers to build upon.

The first set of XML Web services being built, codenamed "HailStorm", are user-centric services oriented around people, rather than specific devices, networks, or applications. "HailStorm" is based upon the Microsoft Passport user authentication system. With "HailStorm", users receive relevant information, as they need it, delivered to the devices they're using, based on preferences they have established.

Servers

The .NET Enterprise Servers, including the Windows 2000 Server family, make up the Microsoft .NET server infrastructure for deploying, managing, and orchestrating XML Web services. Designed with mission-critical performance in mind, they provide enterprises with the agility they need to integrate their systems, applications, and partners through XML Web services, and the flexibility to adapt to changing business requirements. The .NET Enterprise Servers are:

- Application Center 2000 to deploy and manage highly available and scalable Web applications.

- BizTalk™ Server 2000 to build XML-based business processes across applications and organizations.

- Commerce Server 2000 for quickly building scalable e-commerce solutions.

- Content Management Server 2001 to manage content for dynamic e-business Web sites.

- Exchange Server 2000 to enable messaging and collaboration, anytime, anywhere.

- Host Integration Server 2000 for bridging to data and applications on legacy systems.

- Internet Security and Acceleration Server 2000 for secure, fast Internet connectivity.

- Mobile Information 2001 Server to enable application support by mobile devices like cell phones.

- SharePoint™ Portal Server 2001 to find, share, and publish business information.

- SQL Server™ 2000 to store, retrieve, and analyze structured XML data.

Tools

The .NET developer tools provide the fastest and easiest way to create experiences and XML Web services. Visual Studio .NET and the .NET Framework provide the tools that make it simple for developers to build applications that expose and consume XML Web services, with extensive support for multiple programming languages and devices.

Windows XP and .NET Today

With native support for XML and SOAP, Windows XP enables a new set of services on the PC and gets your computer ready to take advantage of the .NET Framework and the upcoming Windows .NET Server, the successor to Windows 2000 Server.

Windows XP includes a number of features enabled by XML-based Web services:

- Remote Assistance

- Windows Messenger

- Online Print Ordering Wizard

- Web Publishing Wizard

- Passport authentication

Remote Assistance

Remote assistance uses Terminal Services technology, allowing a helper to assist you via a remote Terminal Services session. When you initiate a request for help, Remote Assistance sends an XML-based encrypted ticket to the helper who is prompted to accept the invitation, as shown in Figure 2 below. The helper can remotely connect to a problem-PC and view the screen directly to fix the problem.
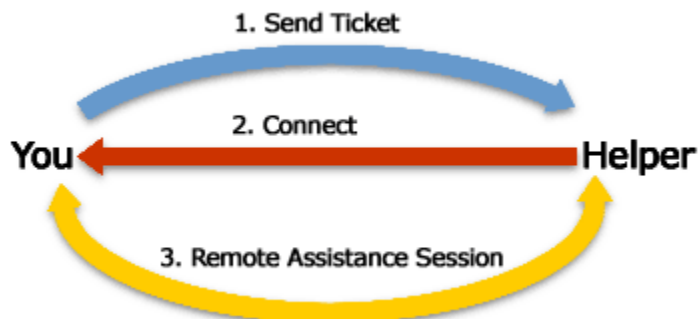
Figure 2. Using Remote Assistance in Windows XP

For more information about Remote Assistance, see *Get Help When You Need it* at http://www.microsoft.com/windowsxp/experiences/howto/remoteassist.asp.

Windows Messenger

The instant messaging client included with Windows XP contains the ability to access information about tab partners. This will allow users to more easily perform a variety of tasks – from monitoring online auctions to accessing account information for many of their bills. It can also launch a Remote Assistance request, as

shown in Figure 3 below.
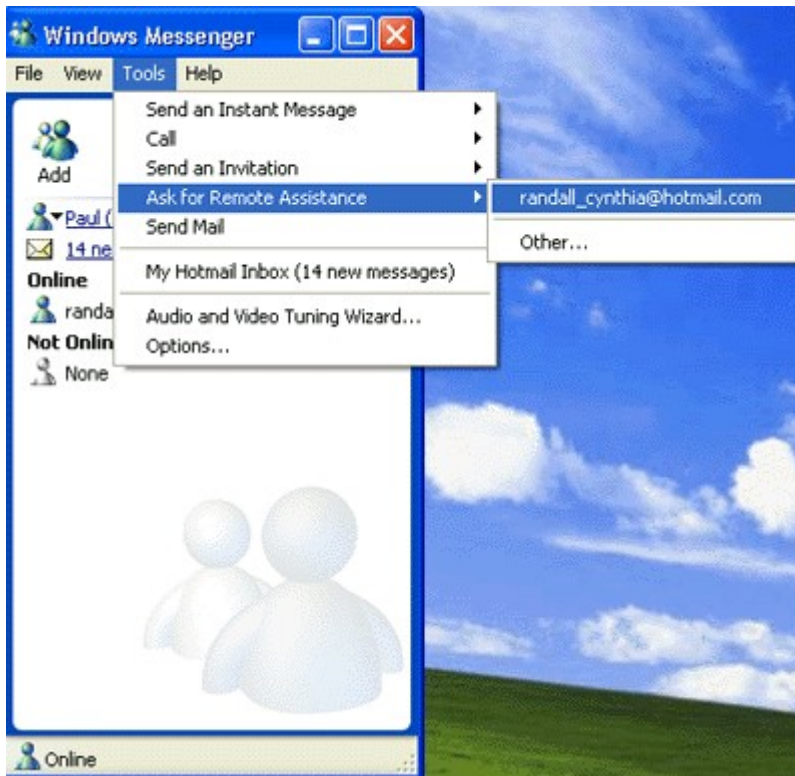
Figure 3. Launching Remote Assistance from Windows Messenger

For more information about Windows Messenger, see *Experience Real Time Communication* at
http://www.microsoft.com/windowsxp/pro/guide/communication.asp.

Online Print Ordering Wizard
As shown in Figure 4 below, users can order photos from any picture folder such as My Pictures. XML is used
to describe the services that are dynamically downloaded as well as describe data contained in the wizard
process. Third parties can plug their photo printing service and use XML to trade data across the wire.
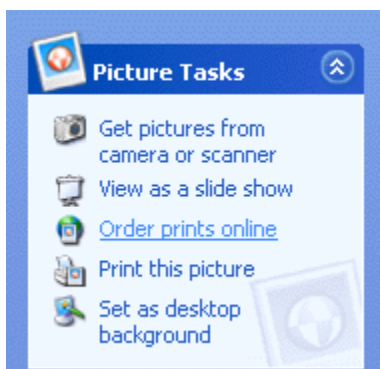
Figure 4. Ordering pictures directly from the desktop

Web Publishing Wizard

As shown in Figure 5 below, users can publish files to the Web using the wizard available in the left frame from most folders in Windows XP. Similar to the online print ordering wizard, XML is used to describe the services that are downloaded as well as describe the data in the wizard itself.
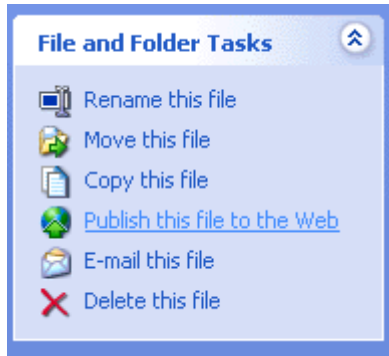
Figure 5. Publishing a file directly from the desktop

For more information about how XML is used in the Online Print Ordering and Web Publishing wizards, see *Building a Site for Web Publishing and Print Ordering* at http://www.microsoft.com/hwdev/imaging/webwizard.htm.

Passport authentication

Windows XP makes it easier to use the .NET Passport authentication service, allowing you to securely login to numerous e-commerce Web sites without having to remember additional user names and passwords. This can streamline other services such as the Web publishing and online print ordering services that require authentication. You can access Passport via the .NET Passport Wizard as shown in Figure 6 below.

Figure 6. Adding a Passport to your user account

Passport works by storing your credentials on a server. What makes this a Web service? When you visit a site that subscribes to the Passport authentication service, your credentials are automatically entered on that site. The site operators benefit by not having to implement their own login process.

Personal information is protected by powerful encryption technology and strict privacy policies, and you are always in control of the services that have access to your personal information, including your e-mail and mailing addresses. Passport is safe to use on public or shared computers.

The PC as smart client
With Windows XP, tasks that used to require several steps and knowledge of computer processes can take place automatically. This will make many computing tasks much simpler and enable more people to use computers effectively.

Most people have witnessed this type of functionality first hand in other areas of life such as the supermarket checkout counter. Once an item is scanned, the system recognizes exactly what it is and how much it costs. But sometimes a scan doesn't work and an item must be entered manually and the checkout line grows longer and longer. In some ways, using a computer has been a lot like a grid locked checkout line; advanced tasks required advanced knowledge and took more time to complete. You had to be smart because your computer wasn't.

Windows XP turns this equation around by making your computer perform more like a smart machine than a dumb terminal. In Windows XP, some increasingly common tasks will be much more automated. Plug a digital camera into your computer and Windows XP will recognize it giving you options for tasks associated with the device: download, e-mail, or publish pictures to the Web.

In the emerging interconnected world of PCs and devices, Windows XP enables your computer to become the central information hub that puts you in control of tasks, information, and services.

The value of the smart client

The PC sits at the center of the growing constellation of devices whose success depends on connectivity with the PC. The Palm or Pocket PCs succeed because they're smart about synchronizing with the information you care about on your PC. If your Palm or Pocket PC was a standalone island of data, it would be a lot less interesting. Likewise, the RIM Blackberry device has proliferated because it's smart about getting to your e-mail.

Contrast that with dumb devices like the network computer. That device hasn't been particularly successful because it's fundamentally a dumb terminal without any significant processing power of its own. You can dress it up, but you can't take the "dumb" out of the dumb terminal.

Windows XP and .NET Tomorrow

Windows XP lets you take advantage of the emerging model of applications built around interoperability via the Internet. One of the central goals of the .NET platform is to enable interoperability of applications via lightweight, simple, and open protocols such as SOAP that can run on existing TCP/IP and HTTP protocols.

Excitement among developers for the .NET platform is high because it introduces a new infrastructure that simplifies application development, providing the tools to make applications more reliable, secure, and easier to deploy.

XML Web Services Scenarios

End users, IT pros, business users, and others will be able to experience new ways of using their PC through XML Web services. Here is a preview of the types of services that might be available in the near future:

- **Printing to your local copy shop.** Using XML Web services, standard word processing programs could integrate with a copy center allowing individuals to print a selected document, pay for it and have it sent to the proper location – all from the convenience of their office or home. Because the service would be exposed and consumed using XML and SOAP, it is possible for the chain of copy centers to easily provide the service to a wide variety of devices and programs.

- **Extending PC-based information to a Web Service.** Information you currently associate with your PC could be accessed via an XML Web service. For example, a Favorites service can let you log on anywhere and still access all your Favorites from your browser. You can check out a prototype of this service developed by the Microsoft MSDN® Architectural Samples team at the fictional company, Cold Rooster Consulting (http://www.coldrooster.com).

- **Easing and simplifying e-commerce.** Complicated business-to-business transactions could be completed from a standardized user interface right on your desktop. For example, you might use an XML Web service designed to optimize costs of office supplies. The service could be configured to get the best price for paper clips from one supplier and the best price for pencils from another supplier. The service would work behind the scenes to locate best prices, initiate and complete orders, and other processing tasks.

- **Getting customized information for free.** Some XML Web services will be available for free over the Internet. For example, instead of using Windows XP to read information on Web sites, you could use a Web service that runs customized applications tracking highly specific queries.

- **Getting customized information at work.** In many organizations, internal communications generates a great deal of information pushed out to employees without much customization. You might be getting lots of information that isn't customized for you. For example, if you work in a book store marketing department you probably want a different view into sales information than employees who work on the warehouse floor. An XML Web service could deliver the same type of information—but customized according to the appropriate user interface and relevant categories. There would be no need to attempt to duplicate the information or spend extra time customizing it for different audiences; the XML Web service would perform this task automatically.

Interoperability

Key to the success of XML Web services in the enterprise is the fact that they are built around open, simple, and lightweight protocols. This permits a high level of interoperability between different operating systems and platforms, delivering flexibility now and in the future. For example, the human relations department could use one platform while the Benefits department uses another. Via an XML Web service, such information could be exchanged and processed regardless of the platform.

"HailStorm"

"HailStorm" is the codename for a set of core XML Web services provided by Microsoft that are designed to help you manage a variety of different types of personal information. "HailStorm" services are oriented around people, instead of around a specific device, application, service, or network. With "HailStorm," information that you may currently store on your PC can become available to you anytime and from any device, a benefit that gives you more control over your data. "HailStorm" also protects personal information by allowing you to control who can have access to it. For more information about "HailStorm", see Building User-Centric Experiences: An Introduction to Microsoft "HailStorm" at http://www.microsoft.com/net/hailstorm.asp.

Summary

Windows XP sits at the center of the emerging .NET platform enabling the PC to consume and process XML-based Web services. This paper is intended to show how Windows XP works in the context of the .NET platform.

Windows XP can power PCs, laptops, workstations, and Tablet PCs In addition to Windows XP, some of the .NET client software that Microsoft will offer include: Windows CE, Windows Embedded, and Windows .NET Server. This software will power PCs, laptops, workstations, smart phones, handheld computers, Tablet PCs, and Xbox™ video game consoles.

Related Links

See the following introductory articles about .NET:

- Introducing Microsoft .NET at http://www.microsoft.com/net/whatis.asp.

- Building User-Centric Experiences: An Introduction to Microsoft "HailStorm" at http://www.microsoft.com/net/hailstorm.asp.

- Next Generation Business Integration: The Advantages of Microsoft .NET at http://www.microsoft.com/business/articles/net/netadvwp.asp.

See the following Microsoft portal sites about .NET:

- MSDN's .NET Developer Center at http://www.msdn.microsoft.com/library/default.asp?url=/nhp/Default.asp?contentid=28000519.

- TechNet's .NET Resource Center at http://www.microsoft.com/technet/treeview/default.asp?url=/technet/itsolutions/net/default.asp.

- Microsoft .NET home page at http://www.microsoft.com/net/.

See the following demonstration Web service:

- Favorites Web Service by the MSDN fictional company, Cold Rooster Consulting at http://www.coldrooster.com.

For the latest information on Windows XP, check out our Web site at http://www.microsoft.com/windowsxp.