



# Windows XP Embedded

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The Mystery Explained



## Introduction

This white paper is intended for people who are looking at Windows-based terminal and desktop appliance technology.

This document will explain what Windows XP Embedded is and how its use in Windows Desktop Appliances (WDA) compares to the more traditional methodology of using Windows XP in standard personal computers.

## The Current Landscape

There are many millions of users around the globe who use personal computers in their daily lives. Some of them use them at home, while there are many others who use them on a daily basis in the course of their work.

Operating systems used also vary, ranging from Windows 95 to Windows ME and Windows 2000 to the latest, Windows XP.

We will go on to explain how Windows XP Embedded can benefit those corporate users who may be using these business orientated operating systems such as Windows 98, Windows NT, Windows 2000 and Windows XP.

Many of these personal computers are employed in client-server systems while others are used in scenarios such as remote access across both telephone lines and wide area networks. There are also many that are deployed in control applications, controlling say, machinery on a factory floor.

But what is common to them all is the fact that all of these devices are equipped with the basic items required of PC's; hard disks, a large operating system and lots of software of which only a portion will ever be used to benefit.

The problem with all this is the level of support that has to be provided.

Rogue software being installed, files being deleted, unauthorised use of applications that are present on the hard disk etc.

Then of course, there is the reliability issue attached to the hard disk and other moving parts.

It is problems like these that gave way to systems like MetaFrame being developed by Citrix Systems, Terminal Server by Microsoft and the technology of thin clients.

Thin clients were born from a range of companies including VXL, and these were powered by operating systems from DOS to Linux to Windows CE. They all connected to the corporate network using either the ICA protocol from Citrix or the RDP protocol from Microsoft.

**So if we can do everything using Citrix, Terminal Server, ICA, RDP and thin clients, why bother about Windows XP Embedded?**

## What is Windows XP Embedded?

Before we discuss “*Why Windows XP Embedded*”, you must understand what Windows XP Embedded is.

First we will begin with a brief explanation of the technology of operating system embedding and its uses in everyday life.

### ***The Technology of OS Embedding***

In today’s world there are literally millions of applications that use embedded operating system technology.

Whether you are driving a modern car or jogging in the park with a Walkman® playing in your ears, you are using technology that has an embedded operating system. Whether it is washing machines or electronic toys, the technology of embedding an operating system and associated software makes the modern day appliance possible.

Essentially, all modern day electronic appliances and goods have a microprocessor that makes use of an operating system and its allied software embedded in a chip. An operating system and firmware so embedded is referred to as **firmware**.

Embedded technology makes today’s world spin.

### ***Windows XP Embedded***

Several years ago, after Microsoft launched its Windows NT (New Technology) operating system a company called VentureCom saw an opportunity to make this great operating system control and power fixed function devices.

So VentureCom licensed the Windows NT kernel and proceeded to produce what was a ‘customisable’ version.

This proved to be popular extremely amongst manufacturers of all sorts of equipment ranging from CNC cutting and milling equipment to car assembly robots.

When Microsoft brought Windows XP to the world, it recognised that an embedded version of this flagship operating system would be much desired.

Windows XP Embedded was born.

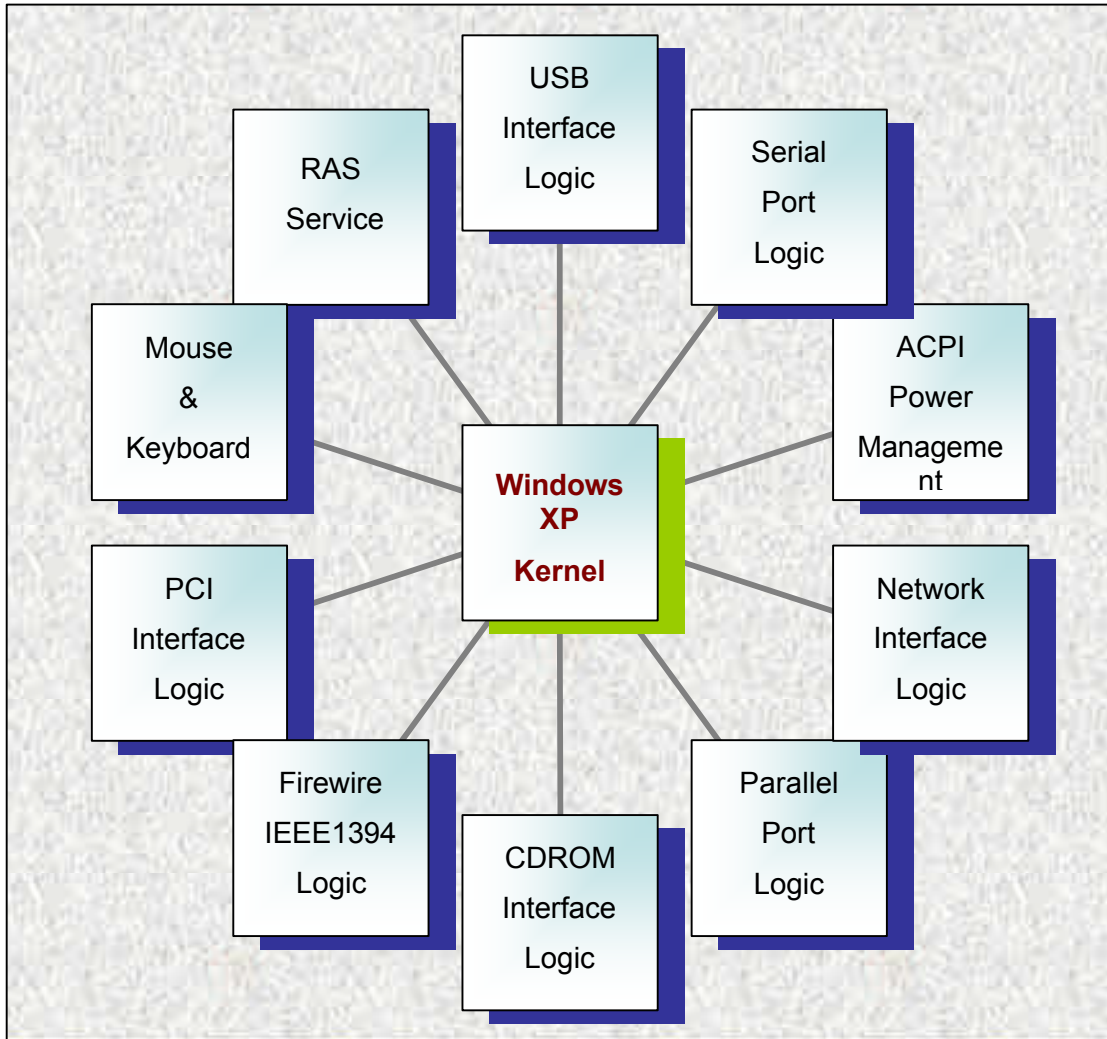
The power of Windows XP together with its ability to have software written for it easily has made it a very successful hybrid of the original operating system.

### ***So what exactly is Windows XP Embedded?***

Windows XP Embedded is what we refer to as a fluid operating system. It is built around a solid core called the NTOSKernel and has bolt-on modular structures that provide the various functions required by the solution that is being put together.

So in the case of the VXL Windows Desktop Appliances, the core is surrounded by the components that support the individual hardware elements. Around this structure are custom glued devices and applications that each individual user chooses.

This glue logic is illustrated for a better understanding in Figure 1.



**Figure 1**

The rule is simple as far as which applications can be glued. If it works on Windows XP Professional, it will work in the WDA powered by Windows XP Embedded.

The NTOSKernel together with its core logic is referred to as the base system. It is the core of all WDA's manufactured and shipped by VXL to its customers.

The real value in a WDA comes in its Custom Device & Application Logic that is glued together by VXL's skilled XP Embedded engineers.

## Custom Device and Application Gluing

In our view there is hardly ever a 'standard' WDA. Each and every unit that VXL has ever shipped has been custom engineered to the customer's own personal requirement – the customer's choice of applications and peripherals.

Whenever a customer wishes to have a WDA custom made for them, we start from the base core system as earlier described.

A careful study is then made of the applications and any hardware devices that the customer may wish to be glued onto the base core system.

Several elements such as compatibility, code size, physical fit and functionality are examined in great detail by VXL's sales and engineering staff.

The following diagram illustrates an actual example of a solution that was designed, constructed and delivered to a company in the United States.

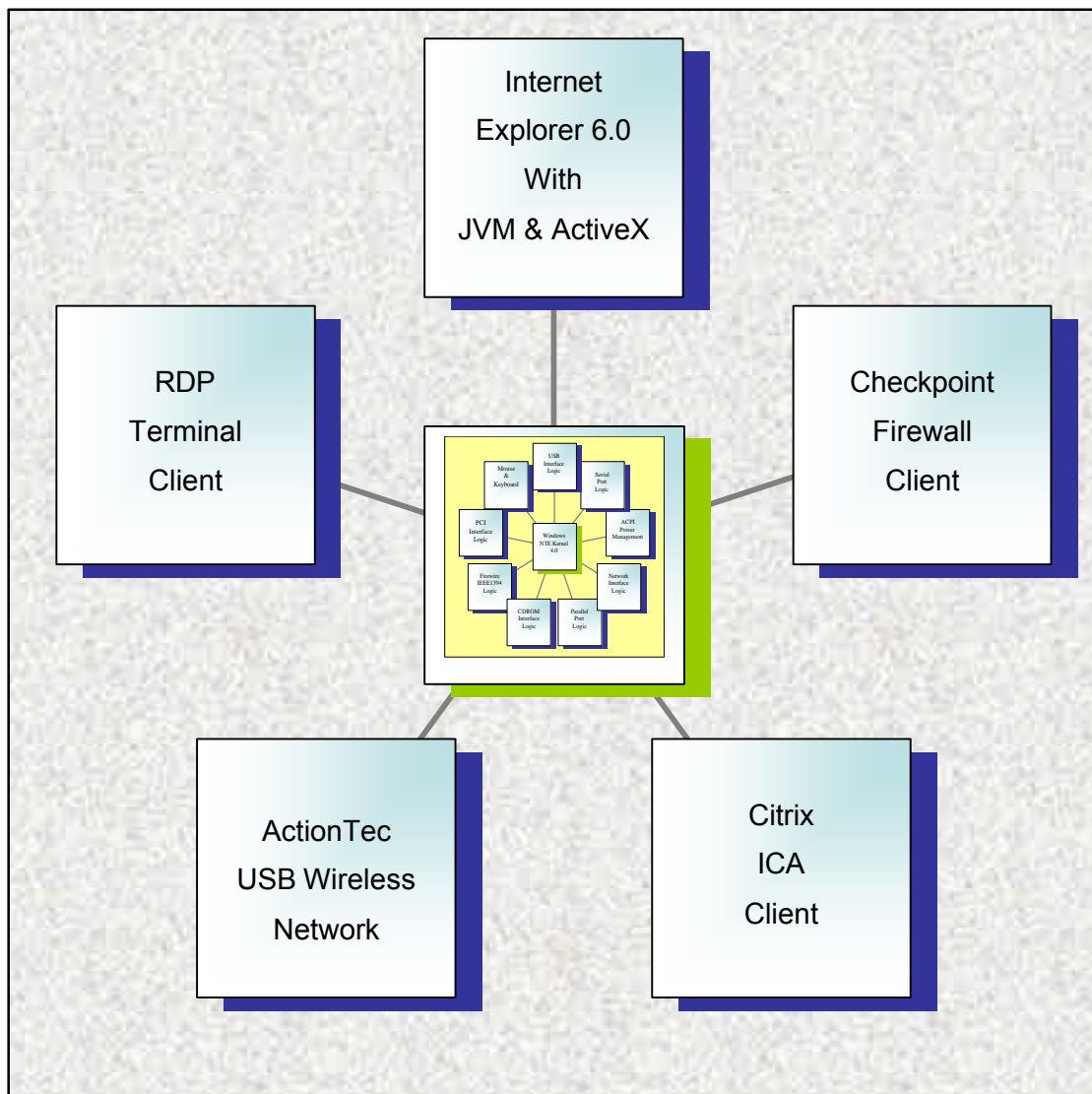


Figure 2

Another example of a XP Embedded WDA solution is:

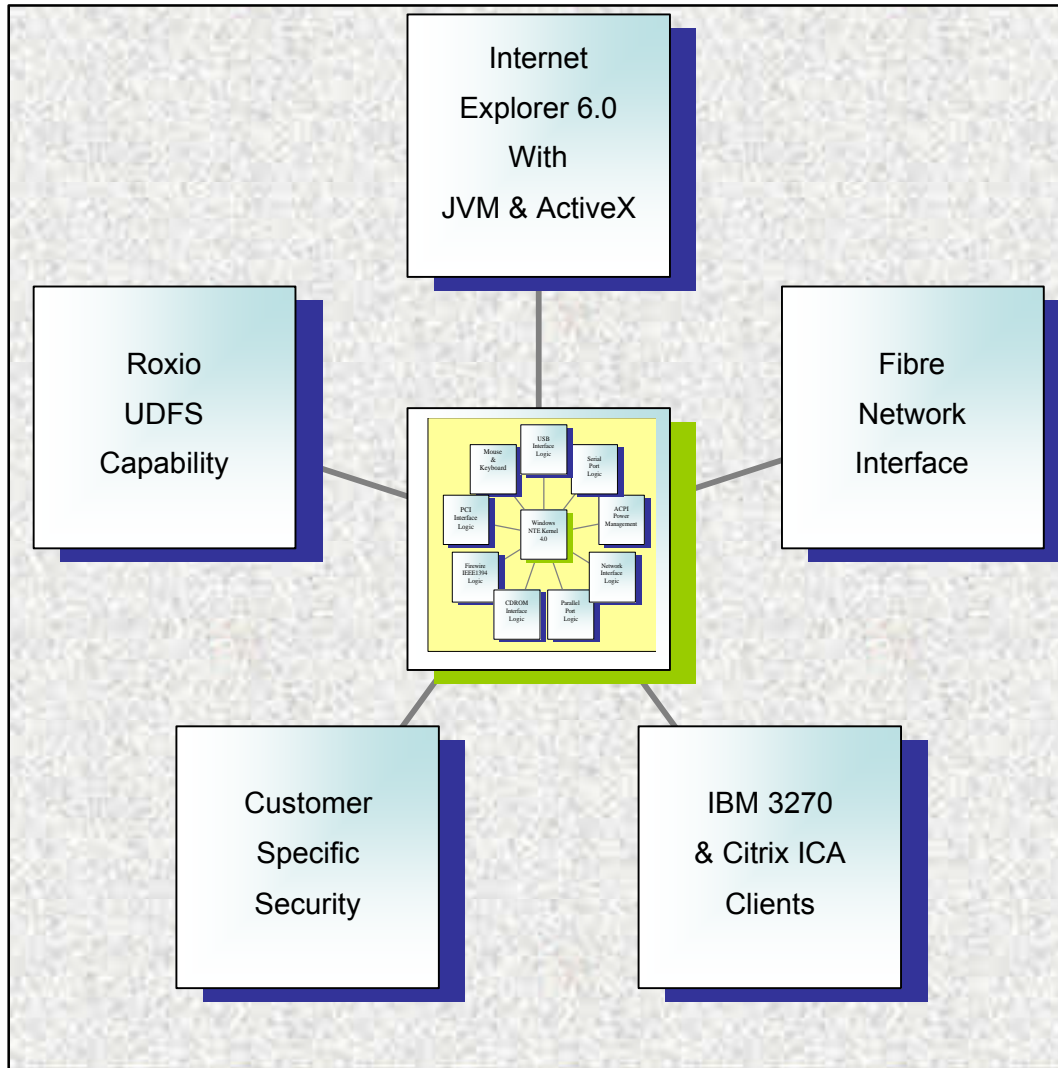


Figure 3

So we can see from the diagrammatic examples provided that a multitude of customised solutions are possible.

But how can such a solution help your organization?

## How does a WDA help you?

In order to understand this we must first understand the PC or thin client that currently resides on your employee's desktop.

### ***The Personal Computer***

I think by now most system administrators, helpdesk support staff and financial directors realise that the presence of a PC brings not only the flexibility of choice, but the nightmare of TCO and support.

Users even though requested, constantly pursue this never ending desire to install games, play games and generally play about with the PC on their desk.

Then there is the constant reminder the "General Protection Fault" gives us of the fragility of the PC's hard disk storage system

Most users who experience General Protection Faults, locked systems or similar disabling events normally tend to power their machines off and then on again.

The invisible element of corrupt files, lost chains and other such harmful residues eventually takes its toll and the system constantly breaks down and needs the on-site help of the system engineer.

What of the thin client then ...

### ***The Thin Client/Windows-based Terminal***

The thin client, or Windows-based terminal has been a saviour to many an administrator and support person.

Finance departments have also seen the benefit of having thin client technology within their network.

The TCO and support costs have vastly reduced providing better value for money.

The problem that thin clients have exhibited is that in some situations they are just not the right tool to use.

### ***The Windows Desktop Appliance***

The Windows Desktop Appliance essentially provides the user with a vehicle that will deliver the best characteristics of a PC together with the TCO, support and reliability benefits of thin client technology.

For instance, let us look at the example provided in Figure 3.

The customer is a governmental organization and required a solution that could provide them with 3270 and ICA connectivity.

They also wanted to have a dual network solution that would allow them to access their ICA network via 100BT and their legacy IBM network using a fibre network.

Another of their requirements was to have the ability to write to re-writable CDRW's using the Roxio UDFS system. But all of this had to work with a bespoke and proprietary security system that was specific to them.

The user felt that the PC's they currently used were both insecure and unreliable.

A Windows Desktop Appliance was created by VXL that provided the user with only what he wanted, keeping maintenance of the WDA down to a minimum as only needed applications were present on the appliance.

In addition to this, the WDA is totally locked down thereby preventing users from both accidental and negligent damage to the appliance's system setup and applications.

The WDA is equipped with a high powered processor from VIA, and therefore delivers its applications at the speed that users are familiar with.

Complementing this power are a range of standard peripheral IO devices such as dual serial ports, USB ports, Firewire IEEE1394 (model dependant) and a PCI interface for additional interfaces such as wireless networking.



The TC3211 WDA also supports vertical solutions such as dual-monitor displays through VXL's partnership with Matrox, providing financial institutions such as share-dealing houses and money markets with an ideal platform.

The partnership with Digi allows the TC3211 to be used successfully as a point-of-sale device providing multiple serial ports for peripheral connectivity.

The entire operating system and its applications are held in flash storage, there is no hard drive although this can be provided in situations where cached data requires local volatile storage.

All in all, the Windows Desktop Appliance from VXL is the perfect solution where the user requires the power of a 32bit operating system, the flexibility of a PC, its devices and applications, together with the reliability of an appliance.

## Summary

The best way to see how a Windows Desktop Appliance from VXL can help your organization is to discuss your particular situation with VXL and its engineers.

Let us help you to achieve a more streamlined network, providing your users with only the facilities they require at the power they desire.

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If you know what features and applications you want, visit our website at [www.vxl.net](http://www.vxl.net), click on the Windows XP Embedded link.



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