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Technical Support

Technical Bulletin

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___ **INTERNAL ONLY**

_X_ **Internal & Customers (as needed)**

___ **Internal & Customers (MANDATORY)**

Title: **VisionPro and 64-bit Operating Systems**

PURPOSE

This document provides information on Cognex VisionPro and Microsoft 64-bit operating systems. It outlines differences in functionality compared to 32-bit operating systems and provides important recommendations on when to use a 64-bit operating system.

TECHNICAL DETAILS

Cognex VisionPro 6.0 is the first generally available software release to support the Microsoft 64-bit operating system on Vista. Cognex VisionPro 6.1 adds support for Windows 7 64-bit operating system. See the VisionPro Documentation for each release about detailed information concerning specific features and limitations on the Microsoft 64-bit operating systems.

Factors that can influence whether to develop an application for the 64-bit operating system over a 32-bit operating system include the following:

- **32-bit Applications are limited to 2 GB of Working Memory**: Some applications easily exhaust the 2 gigabyte memory limit allowed on 32-bit operating systems. For applications that require more than 2 gigabytes of runtime memory using a 64-bit operating system is recommended. Table 1 shows the physical memory limit comparisons for Microsoft Windows XP, Vista, and 7. Note that on a 32-bit operating system with 4 GB of physical memory installed, any one application is still limited to using only 2 GB of memory. This limit does not apply to 64-bit operating systems:

Memory Limit		
Windows XP	32 bit	64 bit
Professional	4 GB	128 GB
Home	4 GB	-
Starter	512 MB	-

Memory Limit		
Windows Vista	32 bit	64 bit
Ultimate	4 GB	128 GB
Enterprise	4 GB	128 GB
Business	4 GB	128 GB
Home Premium	4 GB	16 GB
Home Basic	4 GB	8 GB
Starter	1 GB	-

Memory Limit		
Windows 7	32 bit	64 bit
Ultimate	4 GB	192 GB
Enterprise	4 GB	192 GB
Professional	4 GB	192 GB
Home Premium	4 GB	16 GB
Home Basic	4 GB	8 GB
Starter	2 GB	2 GB

Table 1: Physical memory limits on different versions of Microsoft Windows.

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- **Images in Memory**: Cognex VisionPro applications can approach the 2 GB memory limit if the application requires very large (high resolution or linescan) images, or if the application works on very many images at the same time. The general recommendation is that any application where the acquired image size is "large" should consider using a 64-bit operating system.

    - ***Lots of images in memory***: Some application may use small acquired images but have multiple jobs running simultaneously or may be storing the lots of images in memory for historical results. Under these circumstances although the single image may appear small, the actual amount of memory may be significantly higher. This is called the "***multiplier effect***". That is, to calculate the true amount of memory usage for an application you will need to multiply the acquired image by the number of jobs running simultaneously and/or by the number of images being stored in memory at one time.

    - ***Linescan images***: Linescan cameras can easy acquire very large images. For example, 8K wide by 20K high images are not uncommon. This is 160 MB for grey pixel images and could be 3 times that size for a true color RGB line scan image! More importantly, this image needs to fit into "contiguous" memory. Some applications may not have large chunks of contiguous memory available. It's not uncommon for applications that run on 32-bit operating systems to run out of memory well below the 2 GB allowance simply because the memory is fragmented or because contiguous memory is not available.

      The general recommendation for an application that requires line scan images is to consider a 64-bit operating system. This recommendation is merely a guideline and also depends on many other factors: size of the acquired image, the number of cameras in the system, number of jobs running simultaneously, and the number of images stored in memory at the same time.

- **Development Environment**: Developing a VisionPro application on a 64-bit operating system is similar to developing a VisionPro application for a 32-bit operating system, however, one key difference is that the Microsoft Visual Studio Designer does not support 64-bit edit controls. This means that you cannot use native 64-bit VisionPro Edit controls in Visual Studio.

  Hence, there are two models to developing a VisionPro application targeted to deploy on a 64-bit operating system.

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Model 1: This model consists of developing an application in Microsoft Visual Studio directly on a 64-bit operating system, and then deploying that application on a 64-bit operating system. This model is identical to developing an application on a 32-bit operating system except that one cannot perform edit control development within Microsoft Visual Studio. Even though one can perform VisionPro edit control development, full debugging of the application and VisionPro is still supported.

Development Model 1 requires the 64-bit compiler. To install the 64-bit compiler select the Full install option when installing Microsoft Visual Studio.

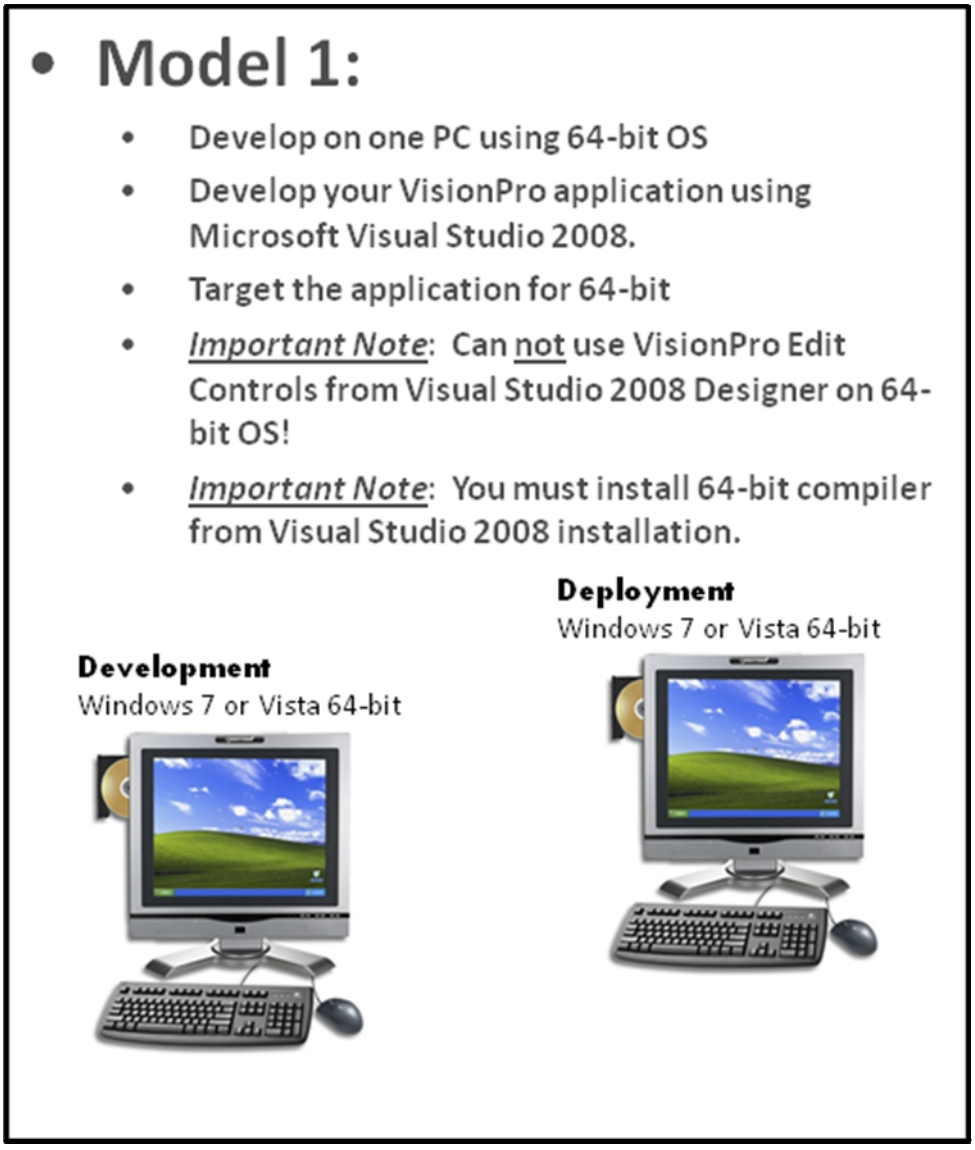

Figure 1: Model1 Development Environment for VisionPro 64-bit

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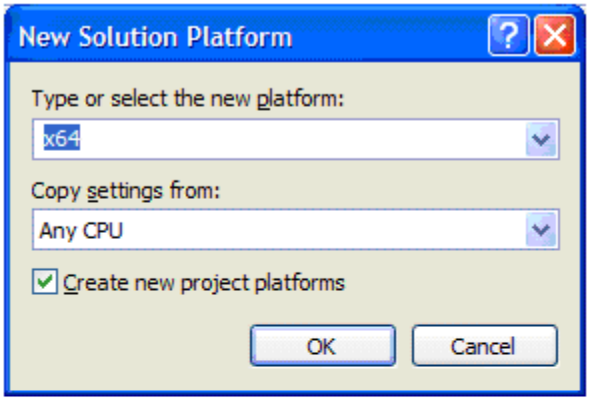
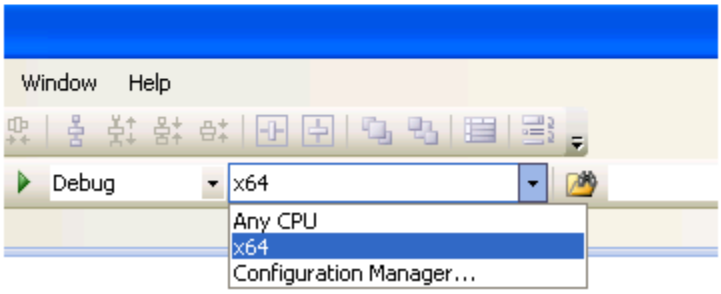
To target an application for 64-bit from within Microsoft Visual Studio setup these dialogs:

Select **x64** from the **New Solution Platform** dialog box:



Choose **Any CPU** for the **Copy settings from** list and click **OK.**

Select **x64** from the **Platform** option within Visual Studio.NET:



Model 2: All development is done on a 32-bit operating system. The application is then targeted for a 64-bit operating system. This model requires 2 PCs. This model is identical to developing an application on a 32-bit operating system. Full use of the VisionPro edit controls can be used in developing an application with Microsoft Visual Studio. .

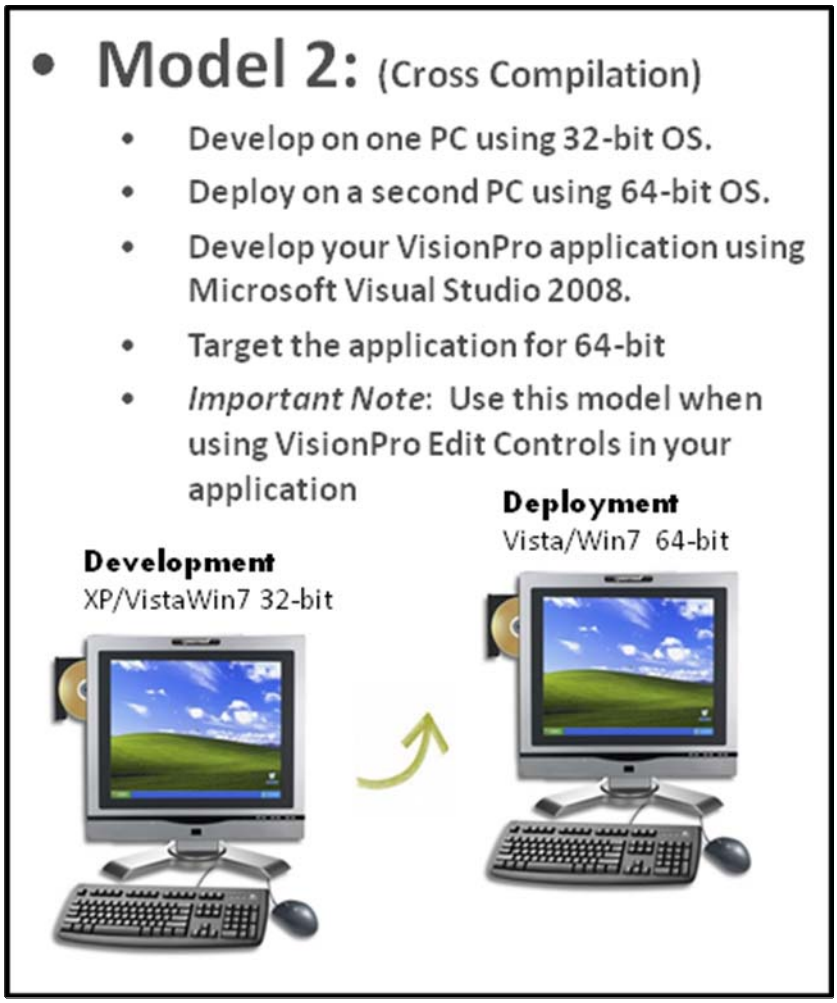


Figure 2: Model 2 Development Environment for VisionPro 64-bit using 2 PC's

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There are also functional differences in VisionPro between 32-bit operating system and 64-bit operating systems. Table 1 summarizes the differences in major areas of functionality.

Table 1: Comparison between 32-bit and 64-bit VisionPro software functionality.

Feature	VisionPro 6.1 32-bit	VisionPro 6.1 64-bit
Operating Systems		
XP 32-bit	✓	
Vista 32-bit	✓	
Windows 7 32-bit	✓	
XP 64-bit		
Vista 64-bit		✓
Windows 7 64-bit		✓
Server 2003/2008		
Acquisition		
GigE Vision	✓	✓ (see release doc)
AIK Adapters	✓	✓
Fire Wire	✓	
MVS-8600 frame grabbers	✓	
MVS 8500 frame grabbers	✓	
MVS -8100L frame grabber	✓	
MVS-8100M frame grabber	✓	
I/O		
Measurement Computing Board	✓	
Documentation		
F1 Help Visual Studio 2005	✓	
F1 Help Visual Studio 2008		
Tools		
Edit Controls	✓	✓ (see release doc)
Application Wizard	✓	
Security		
USB Hasp Dongle	✓	✓
Parallel Port Hasp Dongle	✓	✓
Software Based Licensing	✓	✓
Parallel Port Rainbow Dongle	✓	

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MOVING FORWARD

The decision whether to develop an application for the 32-bit or 64-bit operating system is application-specific. If you have a more demanding application that requires lots of memory then a 64-bit operating system should be considered.

The information in this article is based upon VisionPro 6.0 and VisionPro 6.1. Later versions of VisionPro may include additional functional features that are supported on a 64-bit operating system. You should always check the Release Documentation that comes with VisionPro to determine what features are supported.

For additional information on controlling memory usage within Cognex VisionPro and QuickBuild, refer to the following Technical Bulletin: TB-07-001 “System Out of Memory” in a VisionPro application.