Preventing system crashes with Resource Meter

Introduction to the problem/solution

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If you're running multiple applications, you may notice your system begin to run sluggishly. When this happens, one of your applications may lock up, or worse yet, you might experience a complete system crash. More often than not, you can blame these types of problems on a depletion of a crucial piece of the operating system known as the system resources.

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If you're lucky, you'll see an error message warning you about the shortage of system resources. If you heed this warning, you should be able to avoid a crash. However, chances are that the complete depletion of system resources will occur before Windows 98 can display the error message. When this happens, your system will crash without any warning whatsoever.

Since system resources exist in RAM, you might think that if you have a lot of RAM in your system, you wouldn't have to worry about this problem. However, that's not the case.

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Unfortunately, both Windows 98 and Windows 95 dedicate only a small portion of the available RAM to system resources. This limitation was inherited from DOS and must remain in the operating system for compatibility reasons. Furthermore, you won't be able to solve the problem by adding more RAM to your system. Basically, this means that the system resources limitation is something we're going to have to live with as long as we use the Windows 9x operating system.

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Fortunately, both Windows 98 and Windows 95 come with a little known utility called Resource Meter. You can use Resource Meter to monitor the available system resources and avoid the types of problems we described earlier.

In this seminar, we'll discuss system resources in more detail. Then, we'll show you how to install and use Resource Meter to keep track of your system resources. As we do, we'll provide you with several strategies that you can use to keep your system resources in check and avoid system crashes.

What Are system resources?

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When you launch an application, it loads itself into memory. As it does, the application requires assistance from the operating system. For example, the application needs a window in which to display itself, along with buttons and menus,

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…the ability to open and save files

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…as well as access to fonts, colors, and much more.

To give applications what they need, Windows makes all of these items available from a pool of memory called system resources. As an application loads itself into memory, it grabs certain system resources from this pool. The application then uses the resources to do its job and to communicate with the operating system.

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The Windows system resources pool is actually made up of three separate components: the System, User, and GDI (graphics device interface) components.

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However, trying to make sense of these various components when monitoring system resources is more trouble than it's worth. It's much easier to think of the system resources pool as a single entity.

The problem with system resources

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When the system resources pool was added to the first Windows operating system, the amount of memory dedicated to that pool was sufficient for the software of the times. Once the operating system and software reached the 32-bit stage, it became evident that the limitations built into system resources pool were going to cause problems. However, by this time the size of the system resources pool was set in stone and couldn't be changed. So other mechanisms were put in place to help balance the load.

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Under normal circumstances, the operating system, along with these other mechanisms, can sufficiently manage the system resources pool and is able to support the needs of most running applications. However, not all applications use system resources responsibly. For example, some applications take more system resources than they need, while others don't correctly return system resources to the pool once they're finished using them. Those system resources that aren't returned to the pool are lost and the system resources pool becomes smaller. Once the system resources pool is depleted, it's possible to bring operating system to its knees.

Installing Resource Meter

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Windows doesn't install Resource Meter during a normal installation procedure. Therefore, you must install it separately using the Add/Remove Programs utility.

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To begin, open the Control Panel by clicking Start/Settings/Control Panel. Then, double-click the Add/Remove Programs icon.

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Once you see the Add/Remove Programs Properties dialog box, select the Windows Setup tab. Then, select System Tools in the Components list box and click the Details button.

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When the System Tools dialog box appears, scroll to the bottom of the Components list box and select the System Resource Meter check box.

To complete the procedure, click OK twice-once to close the System Tools dialog box and once to close the Add/Remove Programs Properties dialog box. When you do, Windows will prompt you to insert the CD and then install the Resource Meter.

Resource Meter overview

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Once you've installed Resource Meter, you'll find its icon on the Programs/Accessories/System Tools menu.

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When you load Resource Meter for the first time, you'll see the introductory Resource Meter dialog box. You can select the Don't Display This Message Again check box and click OK.

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When you do, you'll immediately see the Resource Meter icon in the System Tray on the taskbar.

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If you hover your mouse pointer over the Resource Meter icon, you'll see a pop-up readout. This readout displays the actual amount of the currently available system resources in the three categories: System, User, and GDI.

However, as we mentioned earlier, it easier to think of system resources as a single entity. Fortunately, the Resource Meter icon is actually a dynamic gauge that works very much like the gas gauge in a car. When all of the system resources are available, the gauge is full. As the amount of available system resources drops, so does the gauge.

Taking a test drive

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Now let's take a look at how the Resource Meter works. If you restart your system and hold down the [Shift] key to prevent anything in the Startup folder from loading, you will have the majority of your system resources available. To see how much system resources you have, launch Resource Meter, hover your mouse pointer over the icon, and take note of its values.

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Now, if you launch Paint, and then hover your mouse pointer over the Resource Meter icon, you'll notice that the values have dropped a bit. This indicates that Paint has borrowed some system resources from the pool.

If you open several other applications more of your available system resources are slowly consumed. As this happens, you'll see that the green bars on the Resource Meter icon slowly drop much like a gas gauge in an automobile.

If you return to the running applications and begin opening documents, you'll notice that the amount of available system resources drops. Depending on how many documents you open and how large the are, you may notice the green bars on the Resource Meter icon drop as well. This indicates that the resource drain is an ongoing process, as an application's needs change.

When you close one or more of your open applications, you'll see the green bars in the Resource Meter icon rise a bit as the system resources are replenished. If you close all of your open applications, you'll notice that you regain most of your system resources. Keep in mind that you probably won't regain all of your system resources. The reason for this is that not all applications will return the resources that they were using to the pool.

Managing the system resources

Starting Resource Meter automatically
Now that you understand how system resources can be depleted, let's take look at some strategies that you can use to avoid crashes caused by a total depletion of system resources.

In order to use Resource Meter effectively, you should place it in your Startup folder. When you do, it will launch automatically each time you turn on your system. This will allow you to constantly monitor your available system resources by keeping an eye on the Resource Meter icon.

To do so, you'll open the Start menu and select Settings/Task Bar & Start Menu. When you see the Taskbar Properties sheet, click the Start Menu Programs tab and click the Advanced button.

Now, open the Programs\Accessories\System Tools folder, right-click on the Resource Meter shortcut, and drag it to the Programs\StartUp folder.

Closing applications
The number one strategy for managing system resources and avoiding system crashes is to begin closing open applications when you notice that your system resources are running very low. A good rule of thumb here is that when you see only a single green bar in the Resource Meter icon, it's time to begin closing applications.

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If your applications use system resources responsibly, they should return them to the pool as you close the application and you'll see the green bars on the Resource Meter icon rise. You can then launch another application or open another document safely.

Restarting your system

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As we've mentioned, not all applications will return all system resources to the pool when you close them. If you feel you didn't recover enough system resources after closing down an application, you can completely replenish the system resources pool by closing all of your applications and restarting your system.

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If you notice a single bar in the Resource Meter icon that is yellow or red, you'll definitely want to restart your system to completely replenish system resources.

Look out for problem applications

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As you use Resource Meter to track your applications, you'll discover that certain applications use more system resources than others do. For example, Internet browsers-Internet Explorer and Netscape Navigator alike-can be huge resource hogs. While you're connected to the Internet and surfing the Web, you'll notice that your system resources will disappear rather quickly even though you haven't launched another application.

In other words, the longer you surf, the fewer system resources you'll have available. When you notice your system resources dropping, you should close your browser.

Again, if you see enough system resources return to the pool, you can simply reload your browser, and resume your surfing.

However, if you notice that not enough system resources return to the pool, you may need to first restart your system in order to replenish the system resources pool.