Overview

SetRefresh is a utility which attempts to optimize the monitor's refresh rate, and in some cases the resolution, for the best user experience. It does this by querying the capabilities of the display adapter and the monitor. The first time a given monitor and display adapter combination is detected, SetRefresh will set the mode to the preferred timing mode specified by the monitor, if one is specified in the monitor's EDID. If no preferred timing mode is specified, SetRefresh will only try to optimize the refresh rate. If a monitor and display adapter combination has been previously optimized, SetRefresh will determine if the current resolution and color depth combination is one which has not been previously optimized. If so, SetRefresh will try to optimize the refresh rate (the resolution will not be changed). SetRefresh optimizes the refresh rate by selecting the highest refresh rate both the display adapter and the monitor support for a given resolution and color depth. Only refresh rates which the monitor has a preset for will be used. If SetRefresh cannot determine what the optimum display mode or refresh rate is or there is any unexpected condition, then it will simply do nothing.

SetRefresh has no user interface, so other than the display changing modes or refresh rates, there will be no user interaction. The user will never be prompted for input or see anything other than the monitor's refresh rate, and possibly resolution, changing.

SetRefresh is run every time a user logs in. It does not stay resident in system memory. Once it has completed, SetRefresh will exit. It will, however, wait for any Windows™ Plug and Play (PnP) enumeration to complete before it executes. If PnP has not completed within 10 minutes, SetRefresh will exit without doing anything. Any optimizations will occur on the next login.

If the user overrides a setting made by SetRefresh by changing the mode or refresh rate, the user's setting will not be overridden by SetRefresh. Note that changing the color depth selects a new mode and SetRefresh will attempt to optimize the refresh rate.

Q: Why didn't SetRefresh optimize the refresh rate which I logged out and back in after selecting a new resolution?

A: You selected a resolution for which the monitor doesn't have a preset. SetRefresh will only select monitor presets unless the -p option is used. If the -p option is used, SetRefresh will select the highest refresh rate, for the current mode, the monitor and display adapter can both support.

Q: Why wasn't the monitor's preferred timing selected when it was first attached to the system?

A: The monitor's preferred timing is not listed in its presets. To enable the preferred timing to be selected even when the timing is not specified as a preset, the -p option must be used the first time the monitor is detected. This can be accomplished by carefully editing the registry key HKLM\Software\Microsoft\Windows\CurrentVersion\Run\SetRefresh to add the -p option to the value (damaging the registry can prevent your machine from working so don't edit the registry unless you know what you are doing). Future automatic monitor optimizations will use this setting. For combinations which have already been optimized, manually set the resolution to the one specified in the preferred timing and manually run SetRefresh with the -p and -f options to automatically optimize the refresh rate.

Q: Under what conditions will the resolution be changed instead of just the refresh rate?

A: The resolution will only be changed if all of the following conditions are met:
1. It is the first time SetRefresh has seen a specific monitor and display adapter combination.
2. The monitor has a preferred timing specified.
3. The preferred timing is listed in the monitor's presets (as specified by the established and standard timings sections of the EDID), unless the -p option is used.
4. The display adapter can support the preferred timing mode.
5. The mode is in the range which Windows believes the monitor can support (see the next question).

In all other cases, only the refresh rate will be changed.

Q: Why doesn't my monitor get set to its preferred timing and why don't all of the modes my monitor is capable of supporting get listed in the Windows™ Display Properties Page?

A: When a monitor with an INF file is installed in Windows™, the operating system (OS) uses the information in the INF file to determine which modes the monitor supports. Rather than using the horizontal and vertical sync ranges specified in the monitor's INF file and directly comparing them to the required rates for a specific mode, Microsoft introduced a factor into the calculation which effectively requires a monitor's range limits to exceed the required rates by a specified amount. For example, the 1280x1024@75 Hz mode requires a horizontal sync rate of 79.9 kHz. If the monitor's INF specifies the supported horizontal sync range as 31.5-80 kHz, the OS should allow the mode to be selected. In fact, the OS requires the range to be specified as 31.5-83 kHz in order to allow the mode to be selected. This behavior is documented in Microsoft KnowledgeBase article KB309569.

The INF file could be changed to indicate the larger range limits; however, Windows Hardware Quality Lab's (WHQL) certification requires the monitor's INF file to match the data provided

in its EDID. This would work around the behavior in Windows™ but since other operating systems, which perform a direct comparison, rely only on the EDID, changing the EDID and INF to report the larger range could result in other operating systems attempting to set modes outside of the monitor's actual range limits. That could result in a loss of the display image and, potentially, permanent damage to the monitor.

Alternatively, if the monitor's INF file is deleted and the monitor is re-enumerated (which would require the monitor first be removed using the device manager), the OS will allow all of the monitor's supported modes. The downside is that some monitors (those without an ASCII name descriptor) will be listed as a *Play and Play Monitor* while others (those with an ASCII name descriptor and a serial number descriptor) will be listed as a combination of the name and the serial number (e.g. a Compaq P110 with S/N A12345678F would be listed as *Compaq P110 A12345678F Monitor*).

Q: If I change the color depth, will the refresh rate change?
A: In most cases no, but some adapters have limitations on the refresh rate at their highest resolutions and color depths. When such a resolution is selected and the color depth is changed, the refresh rate may be changed to match what the adapter is capable of supplying.

Q: Can I force SetRefresh to optimize the display even if it did it previously?
A: Yes, run SetRefresh with the -f option to force optimization. This does not cause SetRefresh to ignore the flag which indicates that a specific monitor and display adapter configuration has been seen so using this option will not determine whether the resolution is changed or not. In fact, it is superfluous. The first time a new combination is seen, it will be optimized, so no -f option is needed. Subsequent executions of SetRefresh will not change the resolution. The -f option is intended to allow users who manually overrode the refresh rate setting SetRefresh selected, to automatically set the refresh rate to the original optimal setting.

Q: How do I get debug information to determine why a certain mode was selected?
A: Run SetRefresh with the -d option to generate a setrefresh.txt file in the same directory as the executable.

Q: How do I uninstall SetRefresh?
A: Login into an administrative account and run SetRefresh with the -u option to remove all registry entries associated with SetRefresh. Note that the SetRefresh.exe file and the directory it is in are not deleted so this is not the same as removing SetRefresh using *Add/Remove Programs*.

If you run SetRefresh with the -u option from a restricted account, it will delete all of the current user's registry keys but it won't delete the entry in the Run key, the software installation key, or any other users' keys.

SetRefresh can also be removed by using the *Add/Remove Programs* utility in the Windows™ control panel. This will remove all registry entries, the executable, and the directory it is in. The entry in the *Add/Remove Programs* list will only be preset if SetRefresh was installed using the SoftPAQ. If SetRefresh is preinstalled, it will not create an *Add/Remove Programs* entry.

Q: How do I install SetRefresh?

A: The SoftPAQ will automatically install SetRefresh when it is run. However, to install it without the SoftPAQ, login to an administrative account, copy the executable into a directory on the hard disk, and run SetRefresh with the -i option. This will install SetRefresh into the Run key so it is executed at each login. It will also install the software key which indicates SetRefresh is installed and which version is being used. This will not create an entry in the *Add/Remove Programs* list.

If the -i option is used in a restricted account, no changes will occur.

Q: In Windows 2000™ and Windows XP™, when SetRefresh changes the resolution, color depth, or refresh rate of the administrator, why does my restricted (user) account changes as well, and vice versa?

A: Windows 2000™ and Windows XP™ use the Administrator's mode settings for restricted (user) accounts. A change in either the Administrator's account or a restricted (user) account will be reflected in the other account. SetRefresh does not alter this behavior.

The following optional switches can be used to adjust the operation of SetRefresh. When SetRefresh runs at login, none of these options are selected. In the SoftPAQ installation, clicking on the menu entry will run SetRefresh with the -f option. The option switches are not case sensitive.

-d This is used to enable the generation of a file with debug information regarding the display adapter and monitor. It will generate a filed named SetRefresh.txt in the same directory as SetRefresh.exe.

-f This is used to force the optimization to be done, even if the monitor has been previously optimized or the settings have been modified by the user. SetRefresh will not override the user's settings unless it is run with this option.

-i The SoftPAQ will automatically install SetRefresh when it is run. This option is used to install SetRefresh without the SoftPAQ. It will install SetRefresh into the Run key so it is executed at each login. It will also install the software key which indicates SetRefresh is installed and which version is being used. This option must be run from an administrative account. If it is used in a restricted account, it will do nothing.

-p This is used to make SetRefresh optimize the refresh rate for the current display resolution even it this resolution is not a preset mode for the monitor. Normally only presets are selected so the user is guaranteed to get a display which is properly centered and sized.

-u This is used to uninstall SetRefresh. If it is used by a restricted account, it will only remove the optimization flags for the current user. If it is used by an administrative account, it will remove optimization flags for all users, the software key, and the entry in the Run key. It does not delete the executable or the directory it is in.