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A NETWORK ADMINSTRATOR'S GUIDE TO ACTIVATING MONITOR POWER MANAGEMENT WHILE TRANSITIONING TO WINDOWS 2000 OR WINDOWS XP
DRAFT REPORT

INTRODUCTION

An organization can save $10 to $50 per computer annually by enabling power management features that place a computer monitor into a low-power "sleep" mode during periods of inactivity. For organizations, the U.S. Environmental Protection Agency's (EPA's) ENERGY STAR® program offers EZ Save software --a centrally administered software tool that allows you to activate monitor power management ("sleep") features on an entire network of computers simultaneously. Learn more about EZ Save and download it for free at: www.energystar.gov/powermanagement.

Additionally, EPA is slated to release *EZ GPO* in the Spring 2003. *EZ GPO* will allow network administrators to activate and maintain monitor sleep settings through the use of Group Policy Objects (GPOs) in Microsoft Active Directory, Novell Zenworks, or any client/server product that centrally modifies client registries. For more information see http://www.terranovum.com/projects/energystar/ to get docs, beta the program and power management related source code.

However, any PC-intensive organization have a unique opportunity to enable sleep settings quickly and easily during their transition to Windows 2000 or XP. This paper describes how to activate monitor power management during organization-wide transition to Windows 2000 or XP. Many large organizations have chosen this method for enabling monitor sleep settings for its ease and simplicity.

ENABLING MONITOR POWER MANAGEMENT DURING ROLLOUT

If machines are replicated from a template image during the transition to Windows 2000 or XP, enabling the monitor power management setting in the template machine will ensure that all new user logins start out with this energy savings feature enabled. In addition, users can also be prevented from changing monitor power management settings.

MODIFICATIONS TO THE DEFAULT USER/POLICY IN ROLLOUT IMAGE (I.E.; "GHOSTING")

If rolling out Windows 2000 or Windows XP through the use of images (i.e.; using Symantec Ghost or similar software), a system administrator can use a "fire-and-forget" option to set monitor power management policies and ensure compliance with them. When a user logs into a machine for the first time—assuming no roaming profiles in use—the default settings for the user comes from the default user account in the system's "Documents and Settings" folder (C:\Documents and Settings\Default User\ntuser.dat). Under most circumstances, this is the case

for power management settings.[1] By using regedt32.exe[2] (not regedit.exe if using Win2K) and making the necessary edits, all new accounts will now pick up these settings. To do this:

- Open regedt32.exe
- Highlight the HKEY_USERS branch.
- Under the Registry menu, click load hive and navigate to C:\Documents and Settings\Default User\ntuser.dat, or where ever the default user's profile is stored.
- Load that file into the hive naming the branch PMDefault.
- Manually change the PM settings for the currently logged in user:
    - Right click on the desktop and choose properties from the context menu.
    - Choose the screensaver tab from the available tabs. The power management settings are at the bottom labeled "Energy Saving Features of Monitor."
    - Click on "Settings…."
    - Select the power scheme you would like to use as the default. This is normally "Home/Office Desk."
    - Adjust the settings to the desired time out for monitor. Hard disk and System Standby timeouts should be set to never to avoid complications.
    - Click Apply and and OK to commit those changes.
- If regedit is already open switch to it and press F5 to refresh the current view. (Will export old settings otherwise)
- Highlight the key "HKEY_CURRENT_USER\Control Panel\PowerCfg" and select "Export Registry file…." from the Registry menu in the menu bar.
- Export the file making sure that the selected branch option is selected.
- Name the file anything you would like and save it.
- Edit the reg file using a text editor changing the key prefixes (in every key entry) to "HKEY_USERS\PMDefault\Control Panel\PowerCfg." (Please see the Appendix)
- Merge this reg file with the system by double clicking on it.
- Unload the PMDefault hive by highlighting "HKEY_USERS\PMDefault" and under the Registry menu, click unload hive.

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[1] If the last user to login changed their power management settings (with or without a reboot), and a new user logs in next, this new user will pick up those settings.
[2] Regedit.exe in XP or higher. In Windows 2000 there are two versions of regedit. Use the version regedit32.exe.

APPENDIX – TECHNICAL DETAILS BEHIND THE PM REGISTRY KEYS

   The examples used in this section are derived from the initial release of Windows 2000. The offsets for the monitor idle timeout settings are still current through Windows XP SP1. Much of this section contributed by Ed Jones of the Department of Energy (DOE).

The base key is HKEY_CURRENT_USER\Control Panel\PowerCfg.

   The following key is an index of the last six keys in this regedit file. It tells the system which power management schema to use. By default it is set to 0 for the "Home/Office Desk" schema. This key should always be present. Setting it to 3 chooses the "Always On" schema, effectively disabling power management. As you can see there are no individual keys for monitor shutoff, hard disk spin down, etc. All settings are embedded in the binary string associated with a schema. Also note that by simply changing a key like this one below is insufficient to get power management settings to change. You must use the API located in the Windows SDK under "Core\Power Management" if you would like to make these changes yourself.

[HKEY_CURRENT_USER\Control Panel\PowerCfg]
"CurrentPowerPolicy"="0"

Ignore this following key.
[HKEY_CURRENT_USER\Control Panel\PowerCfg\GlobalPowerPolicy]
"Policies"=hex:01,00,00,00,06,00,00,00,03,00,00,00,00,00,00,06,00,00,00,03,\
  00,00,00,00,00,00,00,00,00,00,00,03,00,00,00,00,00,00,00,02,00,00,00,03,00,\
  00,00,00,00,00,00,00,00,00,00,01,00,00,00,00,00,00,00,00,00,00,00,01,00,00,\
  00,00,00,00,00,01,00,00,00,03,00,00,00,00,00,00,00,04,00,00,c0,01,00,00,00,\
  02,00,00,00,01,00,00,00,0a,00,00,00,00,00,00,00,03,00,00,00,01,00,01,00,01,\
  00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,02,00,00,00,\
  00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,03,00,00,00,00,\
  00,16,00,00,00

Ignore this following key. It is a parent to the schema keys.
[HKEY_CURRENT_USER\Control Panel\PowerCfg\PowerPolicies]

This is the default PM schema chosen by Windows 2000.
 [HKEY_CURRENT_USER\Control Panel\PowerCfg\PowerPolicies\0]
"Name"="Home/Office Desk"
"Description"="This scheme is suited to most home or desktop computers that are left plugged in all the time."
"Policies"=hex:01,00,00,00,00,00,00,00,01,00,00,00,00,00,00,00,00,00,00,00,\
  00,00,00,00,00,00,00,00,00,00,00,00,00,32,32,00,00,02,00,00,00,02,00,\
  00,00,6c,00,00,00,43,00,3a,00,58,02,00,00,2c,01,00,00,00,00,00,58,02,00,\
  00,00,00,64,64,64,64,65,00

This is an 80 byte binary field. The offset 038h contains the monitor power off value in "seconds" (NB Hex values).

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The next two registry entries are related to power management.

[HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\Session
Manager\Power\AcPolicy] (Note: Not SessionManager)
"AcPolicy"=hex:01,00,00,00,06,00,00,00,03,00,00,00,00,00,00,02,00,00,00,03,\
  00,00,00,00,00,00,00,02,00,00,00,01,00,00,00,00,00,00,01,00,00,00,00,00,\
  00,00,00,00,00,00,01,00,00,00,00,00,00,00,00,00,00,00,32,00,00,00,02,00,00,\
  00,02,00,00,00,01,00,00,00,00,00,00,00,00,00,00,00,00,00,03,00,00,00,\
  01,00,00,00,03,00,00,00,02,00,00,00,04,00,00,c0,01,00,00,00,02,00,00,00,01,\
  00,00,00,0a,00,00,00,00,00,00,00,03,00,00,00,01,00,01,00,01,00,00,00,00,00,\
  00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,02,00,00,00,00,00,00,00,\
  00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,03,00,00,00,00,00,08,07,00,00,\
  00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,64,64,32,00,\
  00,00,00,04,00,00,c0,00,00,00,00,00

This is a 232-byte binary field (may or may not require modification). The offset 0c0h contains
the monitor power off value in "seconds" (NB Hex values).

[HKEY_LOCAL_MACHINE\System\ControlSet\Control\Session Manager\Power\AcPolicy]
(Note: Not SessionManager)
"AcPolicy"=hex:01,00,00,00,06,00,00,00,03,00,00,00,00,00,00,02,00,00,00,03,\
  00,00,00,00,00,00,00,02,00,00,00,01,00,00,00,00,00,00,01,00,00,00,00,00,\
  00,00,00,00,00,00,01,00,00,00,00,00,00,00,00,00,00,00,32,00,00,00,02,00,00,\
  00,02,00,00,00,01,00,00,00,00,00,00,00,00,00,00,00,00,00,03,00,00,00,\
  01,00,00,00,03,00,00,00,02,00,00,00,04,00,00,c0,01,00,00,00,02,00,00,00,01,\
  00,00,00,0a,00,00,00,00,00,00,00,03,00,00,00,01,00,01,00,01,00,00,00,00,00,\
  00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,02,00,00,00,00,00,00,00,\
  00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,03,00,00,00,00,00,08,07,00,00,\
  00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,00,64,64,32,00,\
  00,00,00,04,00,00,c0,00,00,00,00,00

 The [AcPolicy] key is used at both locations to get the current AcPolicy data. Also, 232-byte
binary fields using offset 0c0h for monitor power in "seconds" (NB Hex values).