Saving on energy costs with MSP Center Plus

ManageEngine Whitepaper

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Save energy costs with MSP Center Plus

Managed Service Providers can leverage the power management features of MSP Center Plus to standardize power settings across thousands of desktops/laptops (spanning multiple customers) enabling huge savings on energy costs. This whitepaper illustrates how.

Green computing

It refers to the practice of using computer resources efficiently using techniques such as virtualization, **power management**, materials recycling, and telecommuting (in this whitepaper we will limit ourselves to just the power management). Though the ultimate goal is to save planet earth through reduced emissions, there is a lot of scope for financial well being by following these practices as they result in huge savings on energy costs.
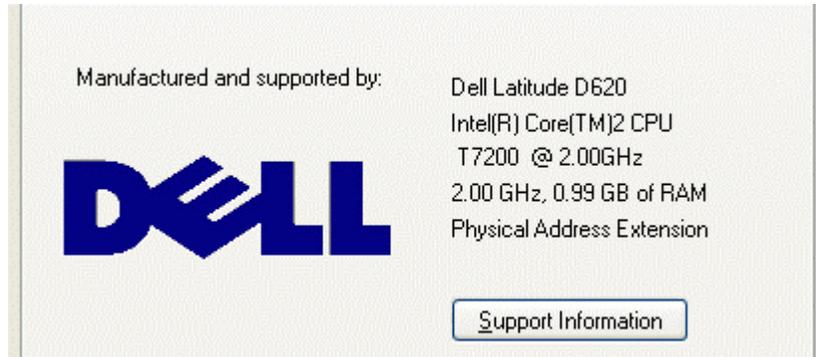

Every computer consumes energy

As I write this document on my Dell Latitude D620 laptop, while listening to KennyG's Rhythm and Romance, the underlying CPU and every little part inside my laptop consumes some amount of power for its operation. Quite obviously it would consume less energy now compared to what it consumes when I run the MSP Center Plus probe and monitor thousands of devices, download a heavy video from youtube.com, or work up a huge graphic on Photoshop. That's why hardware vendors publish two power numbers. One is the Typical Thermal Power which indicates how much the hardware consumes on normal load (such as writing a document) and Maximum Thermal Power which indicates the energy consumed on peak load or worst-case scenario.

CPU consumes the most

The major portion of the consumption happens at the CPU, unless you have a heavy graphic card which has separate CPUs nowadays which consumes more, so let's focus on the CPU power numbers. The CPU that's mounted on my laptop is an Intel Core 2 CPU model number T7200. [Right clicks on my computer icon and choose properties]

Manufactured and supported by:

Dell Latitude D620
Intel(R) Core(TM)2 CPU
T7200 @ 2.00GHz
2.00 GHz, 0.99 GB of RAM
Physical Address Extension

[Support Information]

The Thermal Design Power (TDP) of this processor is 34W (watt). [You can get this info for several other CPU models from this wikipedia page - http://en.wikipedia.org/wiki/CPU_power_dissipation] TDP is equivalent of maximum thermal power.

Model	Clock Speed	TDP	L2 Cache (FSB) (SOI Core)
T7400	2.17 GHz	34 W	4MB (FSB 667Mhz)
T7300	2.00 GHz	35 W	4MB (800Mhz)
T7250	2.00 GHz	35 W	2MB (800Mhz)
T7200	2.00 GHz	34 W	4MB (FSB 667Mhz)
T7100	1.8 GHz	35 W	4MB (800Mhz)
T5600	1.83 GHz	34 W	2MB (FSB 667) (65nm Merom)
T5500	1.67 GHz	34 W	2MB (FSB 667)
T5270	1.4 GHz	?? W	2MB (FSB 800) (65nm)

Let's calculate energy bill

Let's do some calculations here. If I run my laptop non-stop 24 hours for 365 days, then I am going to burn 298kW hour for a whole year

(34 watts * 8760 hours per year) /1000 = 297.84 kW hour

And at the average retail cost of 11.53 cents per kW hour in California, my employer would be paying approx $34 per year

297.84 * 11.53 = $34.34

Assuming that an MSP is managing a total of 1000 such desktops with similar configuration then all desktops put together burn $34k on electricity bill per year

$34.34 * 1000 = $34,340

Extrapolating this figure for 5 years makes the electricity bill touch $172k in 5 years!

$34,340 * 5 = $171,700

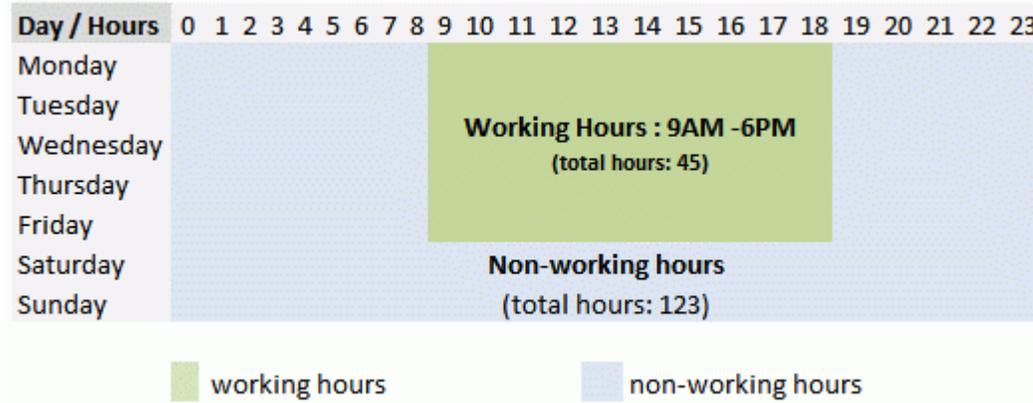To know the average retail price of electricity in your region checkout this website - http://www.ppinys.org/reports/jtf/electricprices.html

Just the Facts
Key Economic and Social Indicators for New York State

The Public Policy Institute
of New York State, Inc.

AVERAGE RETAIL PRICE OF ELECTRICITY, MARCH 2007
(CENTS PER KILOWATT HOUR; RANKED BY ALL-SECTOR AVERAGE)

|	All Sectors			Residential		Commercial		Industrial	
Rank	State	Price	Rank	Price	Rank	Price	Rank	Price	
1	Hawaii	18.73	1	21.48	1	19.2	1	15.99	
2	Connecticut	16.41	2	18.68	2	15.64	4	12.58	
3	Massachusetts	15.13	3	16.86	3	14.95	2	12.81	
4	NEW YORK	14.54	4	16.59	4	14.77	12	8.47	
5	New Hampshire	13.59	6	14.87	5	13.14	5	11.93	
6	Maine	13.44	7	14.26	6	12.89	7	11.73	
7	Alaska	13.08	5	14.87	9	11.73	3	12.77	
8	Rhode Island	12.7	10	13.4	7	12.34	6	11.92	
9	Vermont	12.04	8	13.85	8	12.3	10	8.94	
10	New Jersey	11.85	11	12.8	11	11.47	8	10.7	
11	California	11.81	9	13.7	10	11.53	9	9.14	
12	Delaware	10.83	13	12.19	13	10.93	13	8.29	
13	Maryland	10.28	19	9.76	12	11.12	11	8.79	
14	Texas	10.21	12	12.48	14	10.11	14	7.81	
15	Florida	10.19	15	11.06	16	9.74	15	7.67	
16	Nevada	9.28	14	11.52	15	10.01	16	7.42	
17	Pennsylvania	8.87	17	10.28	19	8.91	17	7.15	
18	Michigan	8.56	18	10.14	18	9.17	19	6.43	
19	Louisiana	8.34	22	9.2	17	9.22	18	6.93	
20	Wisconsin	8.07	16	10.44	24	8.23	21	5.95	

Note: CRT monitors consume more energy than the computers themselves. A 17" monitor could consume on an average 75watts. If there is more number of such monitors in your managed network then include them in the equation for better calculation.

How much of this can I save?

Assuming that my company works from Monday - Friday from 9AM-6PM, and then the amount of actual working time for my desktop is far less than the non-working time.

Day / Hours	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Monday	
Tuesday	
Wednesday	**Working Hours : 9AM -6PM**
Thursday	(total hours: 45)
Friday	
Saturday	**Non-working hours**
Sunday	(total hours: 123)

☐ working hours   ☐ non-working hours

The percentage of working hours vs. non-working hours is stunning. The non-working hours are 73% of the total time.
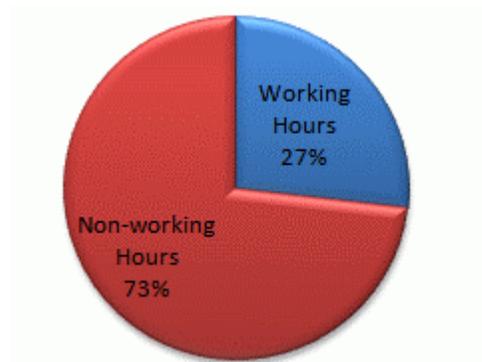
If all these desktops are idle during off-office hours that's a direct 73% savings

$171,700 * 73% = $125,341

And industry reports say that desktops are active only 58% of the time during office hours. Rest of the time is spent on non-computer activities such as phone calls, meetings, lunch, and refreshments. If someone can apply stringent power management schemes and ensure that desktops consume less energy during the idle time (42% of time) then it results in

$171,700 * 27% * 42% = $19,470

So the total savings would be

$125,341 + $19,470 = $144,811

Or simply 84% of your energy bill is saved.
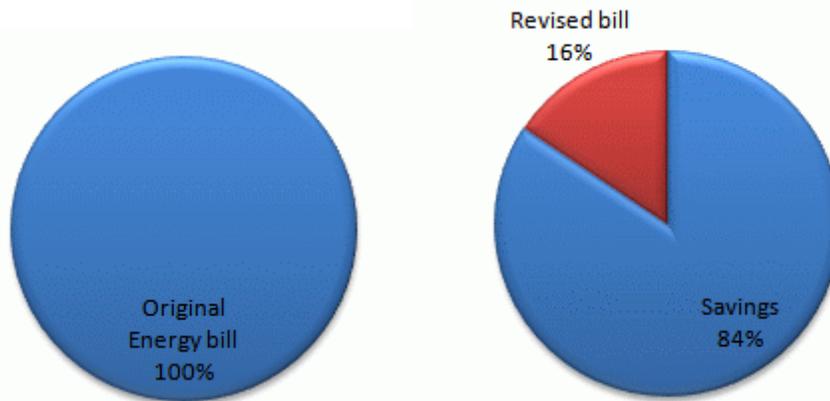
**Power Management for Computers**

Power management refers to the ability of the Operating System to directly control the power saving aspects of the underlying hardware. This includes automatically turning off system components such as hard discs, monitors etc after a period of inactivity. In addition to this the system might choose to hibernate, a state at which most components including CPU and RAM are switched off.

Energy Star Program Started in 1992 by US Environmental Protection Agency as a voluntary labeling program to promote energy efficiency among monitors, climate control machines and other domains. Later in 2006 the enerystar program extended to cover the computing hardware too.	

Windows has this power management option since its early releases as early as Windows 98. The power management options in my Windows XP machine are given below

Power Scheme

You can launch the Windows Power Options Properties screen by right clicking on the power icon on tray and choosing Adjust Power Settings. You can modify, delete, and add (save as) new power schemes from this screen.
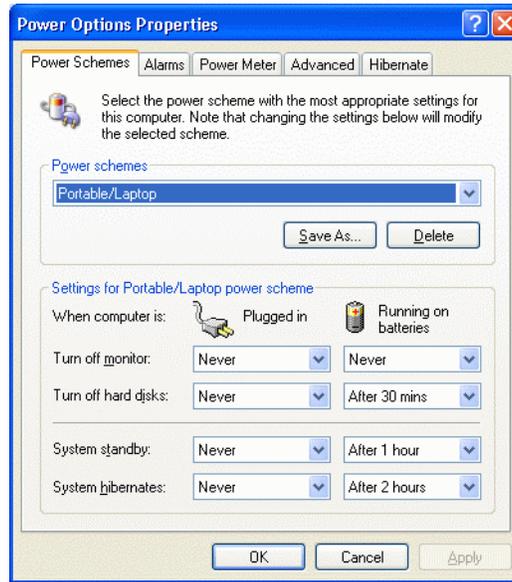

Hibernate

Enabling hibernate option in every managed desktop and laptop is very important from a power management perspective. Hibernate is more like a soft shutdown. The system stores everything it has to the hard disc, cleans the memory, and then shuts down.
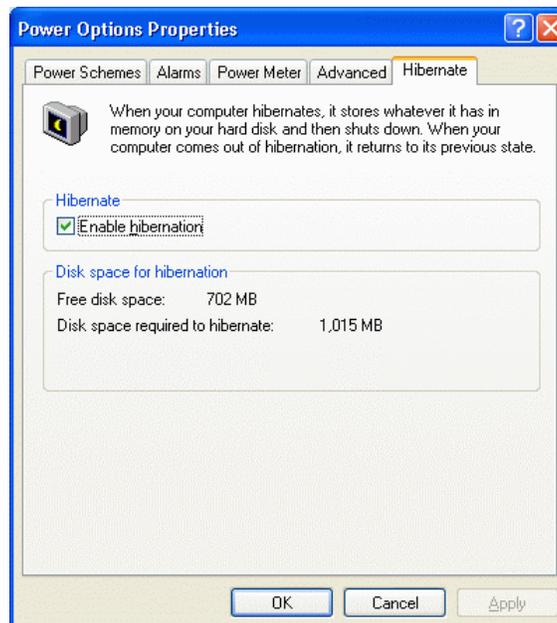
Advanced options

The advanced options screen gives options such as password protect, power buttons options, show icon on taskbar etc. You can configure each power buttons differently.
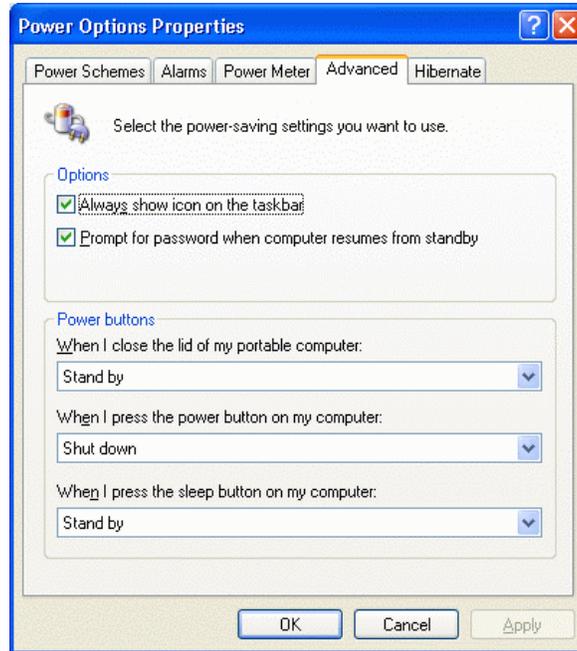
Standardizing Power Management Settings Using MSP Center Plus

MSP Center Plus uses an agent-server architecture where tiny software agents are installed in each managed desktop/laptop. You can issue commands to these agents from the central server user interface.
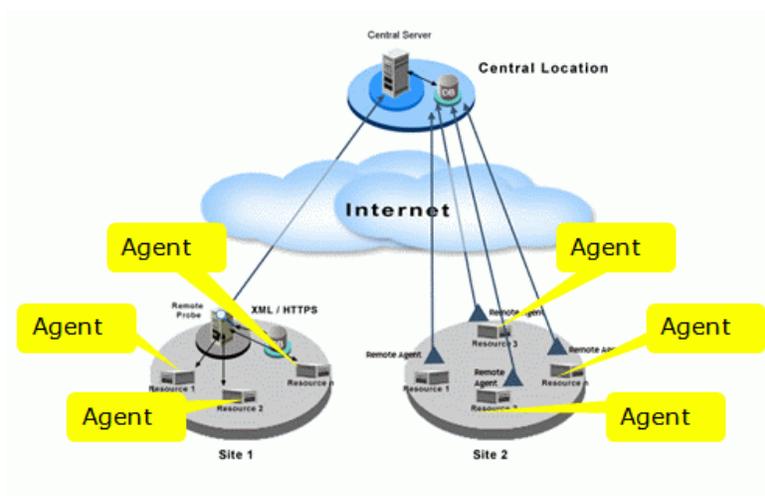
Power Management Options

Following are the list of power management features available in MSP Center Plus

Create, modify, and delete power management schemes. Set a power scheme as active power scheme, Overwrite scheme if already present	You can apply, modify, and delete power schemes across thousands of computers and laptops (across many customers) in a snap. All this from your remote operations center. **Feature: Power Management Configuration**
Enable Hibernate support	You can turn on hibernate option too remotely. **Feature: Power Management Configuration**
Scheme options Turn off monitor after x minutes Turn off hard disc System Standby System Hibernate	You can set different settings for AC power and batter power. **Feature: Power Management Configuration**
Advanced Options Prompt for password when computer standby Always show icon on taskbar When I close the lid When I press the power button on my computer When I press the sleep button on my computer	You can turn on/off all advanced options. **Feature: Power Management Configuration**
Shutdown systems during non-working hours	You can even shutdown idle computers, during non-working hours, using the scheduler option in MSP Center plus. **Feature: Scheduler and vbscript**
Turn off screensavers	You can turn off the energy consuming screensavers using the registry settings option in MSP Center Plus. **Feature: Registry settings**

Creating a power management scheme

MSP Center Plus uses a template equivalent model for all configurations. For example, to apply a power management setting to 1000 desktops you need to open the Power Management Configuration screen, input all required details and then apply it to select desktop and laptop users.

Open power mgmt Configuration → Input scheme values → Apply to select computers

Power Management

Create Scheme | **Modify Scheme** | **Delete Scheme**

*Scheme Name: pwrmgt for laptops

☐ Overwrite if scheme already exist

☐ Set as active power scheme

☑ Enable Hibernate support

Settings

Load Default Scheme

When computer is:	Plugged in	Running on batteries
Turn Off Monitor:	After 20 mins	After 2 mins
Turn Off Hard Disk:	Never	After 5 mins
System StandBy:	Never	After 15 mins
System Hibernate:	Never	After 2 hours

Advanced Options

Options

☑ Always show icon on the taskbar

☐ Prompt for password when computer goes off StandBy

Power Buttons

When I close lid: Do nothing

When I press the power button on my computer: Do nothing

When I press the sleep Do nothing

Shutdown idle desktops during non-office hours

The draw back in Windows Power Management feature is that it doesn't allow one to deploy different power schemes for different time periods. For example office hours vs. non-office hours. A lot of desktops and laptops stay awake all night and all weekends just consuming energy for nothing. If there is a way to shutdown idle user desktops during non-office hours it would be really save a lot.
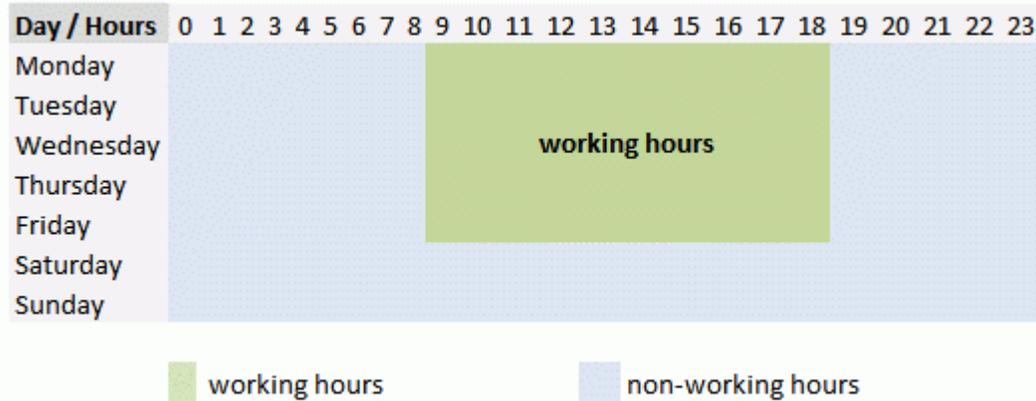
MSP Center allows you to achieve this using a simple VBScript and the scheduler configuration. You need to write a simple VB script such as this

```
myDayName = weekday(Date)
Wscript.Echo myDayName
myHour = Hour(Now)
Wscript.Echo myHour
'if day is saturday or sunday or hour is less than 9 or greater than 18 then
shutdown
If(myDayName =7 Or myDayName=1 Or myHour < 9 Or myHour > 18) Then
   Call ShutDown()
End If
Sub ShutDown()
   Set objWMILocator = CreateObject("WbemScripting.SWbemLocator")
   objWMILocator.Security_.AuthenticationLevel = 6
   objWMILocator.Security_.Privileges.AddAsString"seShutdownPrivilege",True
   set objWMIComp = objWMILocator.ConnectServer(strComputer, "root\cimv2")
   'Get connection To local wmi
   Set Connection = GetObject("winmgmts:root\cimv2")

   'Get Win32_OperatingSystem objects - only one object In the collection
    WQL = "Select Name From Win32_OperatingSystem where Primary=true"
    Set SystemClass = objWMIComp.ExecQuery(WQL)
```

```
 'Get one system object
 For Each System In SystemClass
   System.Win32ShutDown (1)
 Next
End Sub
```

Save the VBScript as working-hours.bat. Now you have to apply this script to all desktops and laptops using the MSP Center Plus scheduler option.

Scheduler Configuration

Create Task | Modify Task | Delete Task

*Name of the task: [_____]

      ☐ Overwrite if task already exist

*Application Name: [_____] ☆

Arguments: [_____] ☆

*Run As: [_____] ☆

Password: [_____]

Confirm Password: [_____]

*Perform this task: ○ Daily

           ○ Weekly

           ○ Monthly

           ○ Once

           ○ At System Startup

           ○ At Logon

           ⦿ **When Idle**

           When the computer has been idle for: [120 ▼] minute[s]

Turning off screensavers

Even screensavers consume considerable amount of energy and hence it is advisable to turn them off. You can turn off the screensavers of thousands of desktops and laptops remotely using MSP Center Plus. It helps you write into the registry of each computer to turn off the screensavers.

Manual steps to disable screensaver for currently logged on user

To disable the logon screen saver, follow these steps:

1. Click Start, click Run, type regedt32, and then click OK.

2. Locate the following registry key:
   HKEY_CURRENT_USER\Control Panel\Desktop

3. In the Details pane, double-click the ScreenSaveActive string value item.

4. In the Value data box, replace the number 1 with the number 0, and then click OK.

You have now disabled the screen saver.

Disabling screen saver using MSP Center Plus

Custom group option

MSP Center Plus allows you to group the users based on department or other rules such as location (first floor, second floor) etc. All the above mentioned configurations will be applied based on this grouping. For example if you wish to standardize power settings across all users in finance department of customer Reliance, then you need to create a custom group as shown below.

Create New Group 💡 Help

Create a new group to group computers or users.

Group Name	Finance Users
Select Customer	Reliance ▼
Group Type	○ Computers ◉ **Users**
User Entries :	aaron, arnold, bill, Craig, commonPC, Daisy, Cesar, Dennis, Donald,Edward, elliot, Fleming, Gibson, harley, Jacob, jeff, jason, john, lopez, xavior,

*User entries must be coma separated

[**Create Group**]   [**Cancel**]

The group thus created will be selected when you apply a power management configuration. See picture below.

Choose Targets Help

Select a Customer: Reliance ▼

Apply to: ○ Customer ○ User ◉ **Custom Group**

Custom Group: Finance Users [Browse]

[Use comma ',' to separate multiple values]

☐ **Exclude Target**

[Add More Targets]

[**Deploy**] [**Save as Draft**] [**Cancel**]

Conclusion

Whether your intentions are to save planet or not, you should try the power management options in your managed desktops and laptops for it saves a huge amount of money for your customers. With tools such as MSP Center Plus giving you the required control and flexibility it is all the more easily to do it. For more details on MSP Center Plus please visit http://www.mspcenterplus.com/. For a free 30-day trial of MSP Center Plus visit www.mspcenterplus.com/download.html.

This product is priced at $25 per object for all its features including power management. Other features include remote monitoring, patch management, asset management, software license management, remote control, SLA management, an integrated helpdesk, professional service automation with tech scheduling, timesheets, invoicing and a lot more. For clarifications on this document or assistance please email msp-center-support@manageengine.com