

Tutorial



Version 3.0



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Power Management with PwrSmart™ 3.0

PwrSmart is a simple, automated PC power management solution that centrally controls PC power settings and energy consumption. PwrSmart's flexibility creates a self-monitoring, self-maintaining, enterprise-wide PC power management solution that frees up IT staff, reduces energy costs, extends the life of IT assets and supports green initiatives.

New Features in PwrSmart 3.0

PwrSmart 3.0 provides enhanced, user-friendly functionality that extends IT administrator control over PC power management settings and energy management.

- Simplified Console allows administrators to select from several EPA-recommended power schemes or to create and edit their own custom power schemes right in the Console. In addition, the energy savings calculator is now fully integrated into the Console.
- PwrGroups™ (leveraging patented Smart Update technology) make it simple for IT administrators to dynamically target and group computer with similar power management requirements, standardizing and fine-tuning PC power management across an organization. PwrGroups can be based on Active Directory group membership, PC location, IP address ranges, hardware configuration, operating system language, time zones and many other parameters. Laptop and Desktop PwrGroups are built into included in the Console.
- Customizable Power Schemes allow IT administrators to control and enforce multiple power profiles on the same system to accommodate different power settings depending on the time of day — any computer, any setting, any time.
 - Power management events can be scheduled to wake up, shut-down, hibernate or standby PCs after a pre-set period of inactivity or on a schedule.
 - Alternate Settings option lets IT administrators configure settings that differ from a scheme's default settings for use during a specific time period each day.
 - Stay-awake period allows IT administrators to override power management actions in order to patch, update, scan, or back up PCs on a predetermined schedule. Stay-awake period can also be used to give users a block of time when they can remotely access their workstations before the PCs enter their scheduled hibernation period.
 - Software exclusions allow administrators to exempt PCs from scheduled power management events when specific applications are running to ensure that critical processes are not interrupted.
- Dynamic energy savings calculator displays instant analysis of energy saved on the managed computers based on multiple criteria. The calculator also allows administrators to compare energy savings over two different time spans or different groups of computers and to project energy savings out to an annual basis. Multiple currencies are supported in the calculator.
- Flexible reporting engine lets administrators create standard or customized reports.
- Security Roles give administrators the flexibility to specify pre-defined roles and to customize permissions to allow or deny access to specific functions in the PwrSmart Console.

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Getting Started

Overview of Power Management Steps using PwrSmart 3.0

Below is a suggested workflow for using PwrSmart to manage and control PC power settings in order to save energy, save money and support your company's Green IT initiatives.

1. Run the setup to install the PwrSmart Server and Console. *Installing PwrSmart*
2. Install the PwrSmart client on 25 workstations. **Note:** The licenses for PwrSmart are for workstation operating systems only, not server operating systems. If you inadvertently install the client on a server, that machine will automatically be removed from the Console. Details here: *Manage Computers by Installing the PwrSmart Client*
3. As the client computers start communicating with the PwrSmart server, they will sort themselves into pre-built Laptop and Desktop PwrGroups. They will also join Organizational Groups based on their Active Directory OU membership.
4. Before assigning any power schemes to the managed computers, think about how you want to calculate your power usage baseline so that you can later see the energy savings you've realized with PwrSmart. New Boundary Technologies recommending running a one-week "baseline" period, followed by a one-week "power management" period. Details are here: *Calculating Your Power Usage Baseline*.
5. After your one-week baseline period has ended, use the energy savings calculator to find out what your current and projected energy savings are without using PwrSmart to manage PC energy usage.
6. At the beginning of the 2nd week power management period, assign one or more of the included power schemes to a group of computers. (If desired, you can assign power schemes to individual computers.) Let the energy savings accumulate for one week. At the end of the week, again run the energy savings calculator to find out how much additional energy you've saved by using PwrSmart.
7. Compare energy savings results to baseline from step 4 above.

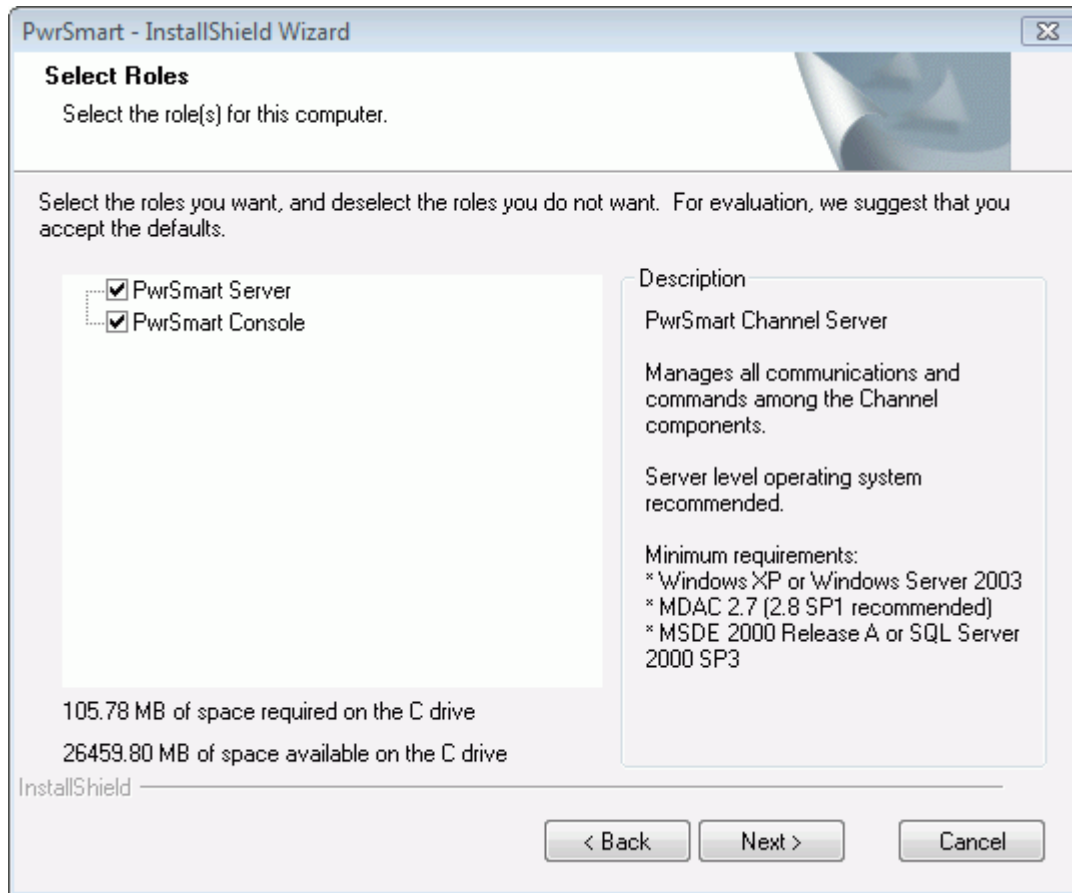
Install PwrSmart

PwrSmart 3.0 System Requirements

Sever and Console Installation

The PwrSmart contains two components: the server and the console. For evaluation purposes only, it's not necessary to install the PwrSmart components on a server OS if one isn't available for testing. You can install both components on a Windows XP or Vista workstation OS. However, when you go into production mode after purchasing PwrSmart, you will need to install on a server OS. The console can also be installed on a workstation, which allows you to connect to the PwrSmart server remotely.

To install PwrSmart, follow the steps in the setup wizard. You will need the serial number provided to you by New Boundary Technologies in order to proceed. When you are asked to select the role(s) for the computer where you are installing PwrSmart, accept the default for both roles and proceed.



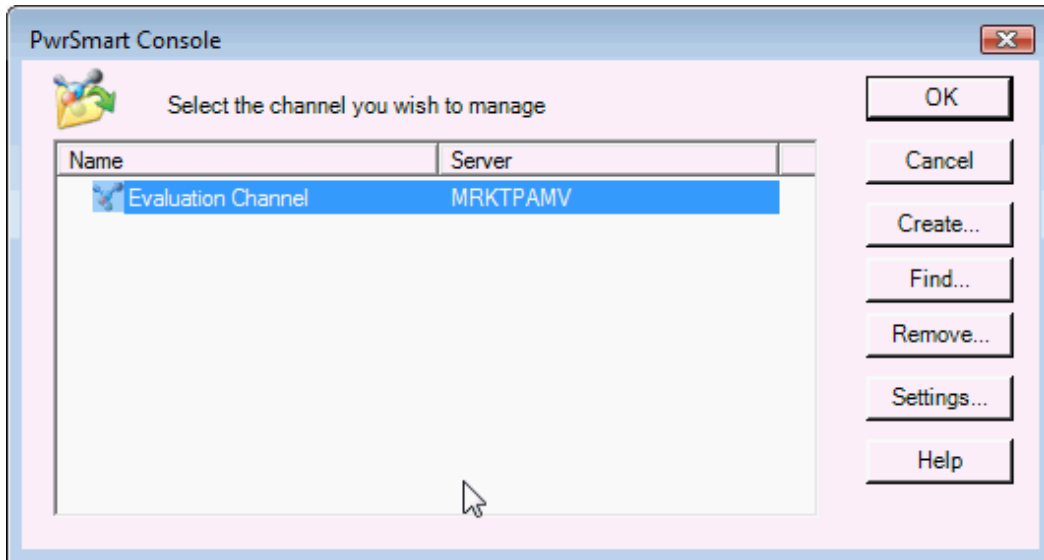
PwrSmart requires a SQL database. You can simply let the setup install SQL 2005 Express on the local system. Alternately, you can choose to use an existing SQL server and instance that is already installed on your network.

The PwrSmart installation will install all necessary Microsoft components if they aren't already installed.

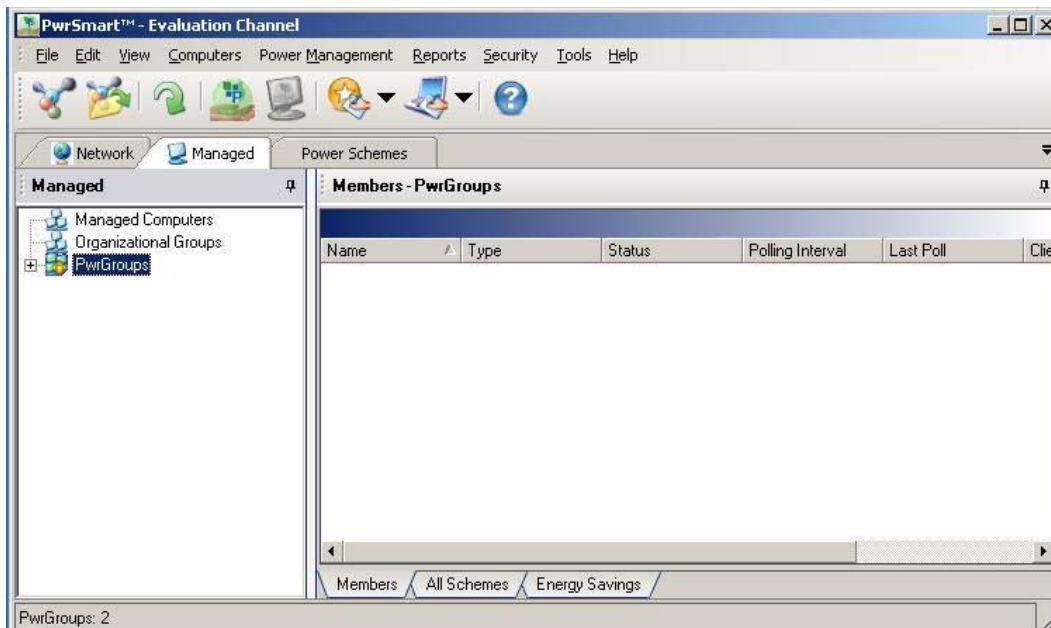
Launch the Console

1. Launch the **PwrSmart Console** from the Start menu.

2. The channel selection dialog appears, containing the available channels. Select the Evaluation Channel, and press **OK**.

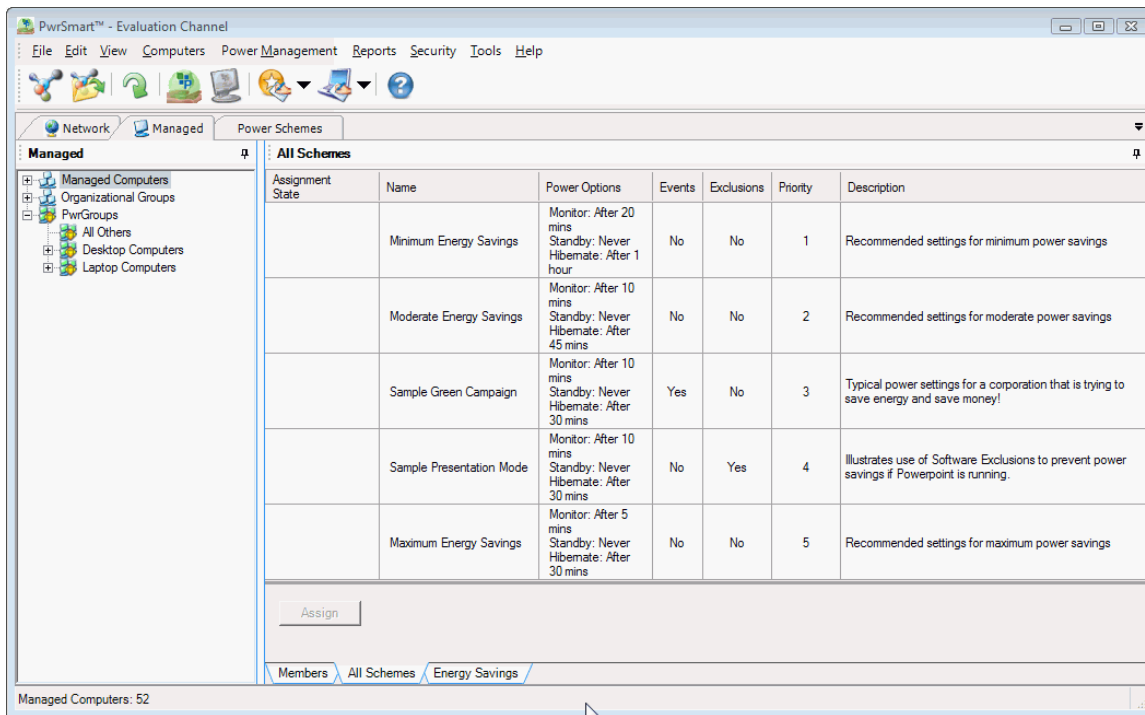


3. The Console for the Evaluation Channel appears as shown below the first time it is launched.




Explore the Console

The PwrSmart Console is where you add computers to be managed, create groups to organize the computers, and create, edit, assign and monitor power management schemes.



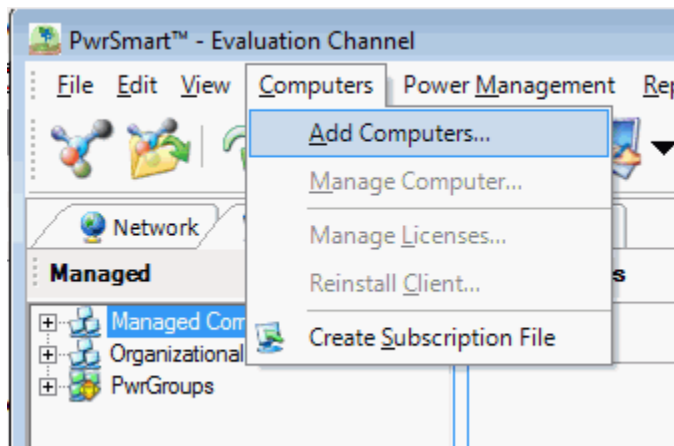
Some of the key elements of the Console's main window include:

- **Menu bar** - This provides access to all main functions.
- **Tool bar** - This provides quick access to various functions. Of particular importance is the Refresh button . This is used to refresh the Console with the latest data and status from the Server, although this generally occurs automatically.
- **Tabs** - The tabs beneath the tool bar expose major areas of functionality.
 - **Network:** This tab allows you to select computers to manage.
 - **Managed:** This tab shows the currently managed computers and organizational groups.
 - **Power Schemes:** This tab is where you manage your schemes.
- **Tree view** - The left hand pane contains a tree view perspective relative to the currently selected tab.
- **Details pane** - This pane to the right of the tree view shows detailed information relative to the currently selected item in the tree view. The contents are controlled through tabs at the bottom of the window.
 - **Members:** Contents of the group or item selected on the left
 - **All Schemes:** Shows all available power schemes in a tree view.
 - **Energy Savings:** the built-in calculator for seeing your energy savings.
- **Status bar** - This is at the bottom of the window, and provides information on the currently selected item or action.

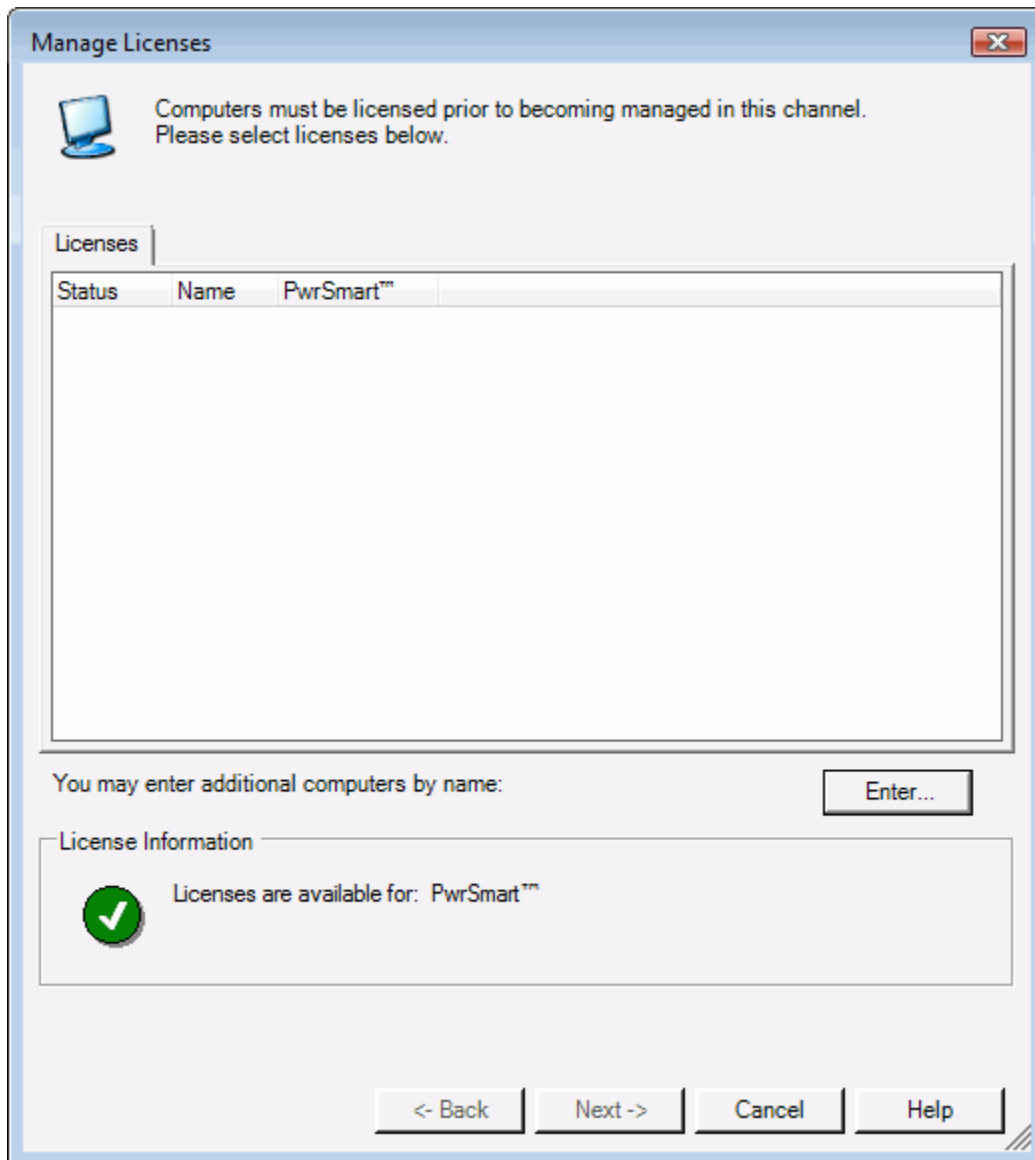
Manage Computers

The first step in managing power usage on PCs with PwrSmart is to manage some computers. You manage a computer by installing the Client on that computer. This section will take you through that process.

1. On the Computers menu select **Add Computers...**

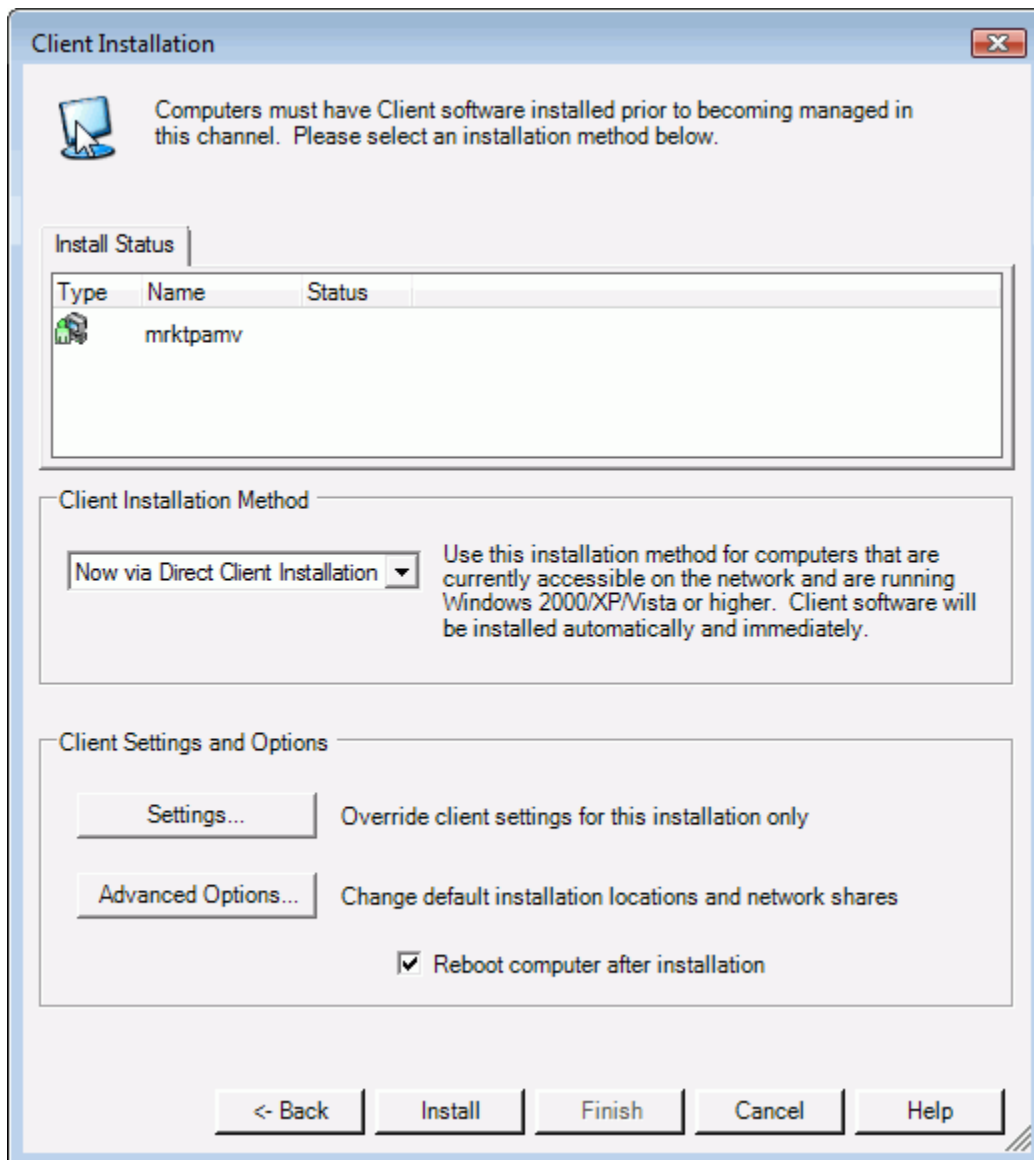


2. The Manage Licenses dialog appears. Press **Enter...**

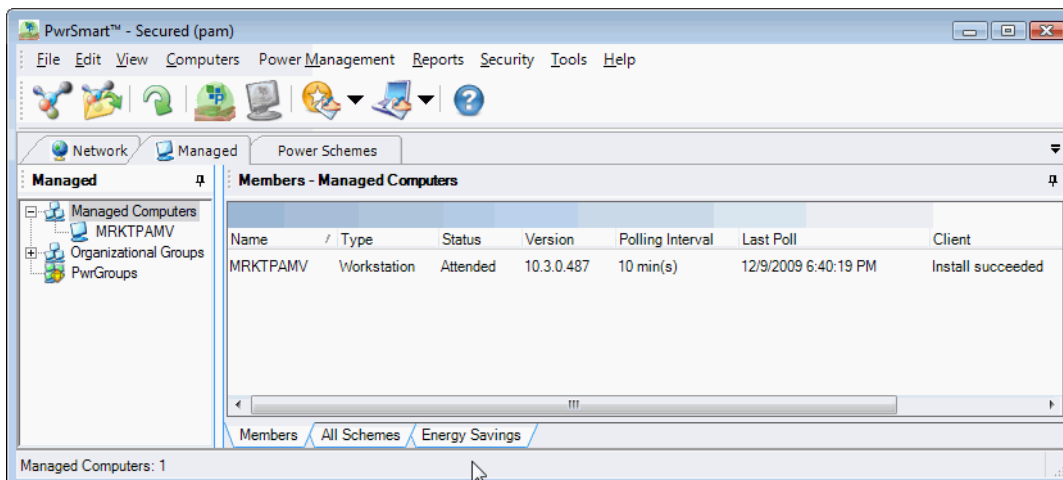


3. In the **Add Computer** dialog, enter the name of the first computer you want to add, then press **OK**.
4. On the **Manage Licenses** dialog, press **Next**.

5. On the **Client Installation dialog**, press **Install**. This will install the Client to that machine and reboot it. This is called the Direct Install method, and certain conditions must be met in order for it to succeed: a) You must be logged into the PwrSmart console as a user who has admin-level rights on the target computer; b) the target computer must not be locked down in any way. For information about troubleshooting Direct Install issues, refer to this KB article: *Direct Install Troubleshooting*



6. When the Client installation is complete, press **Finish**.
7. Select the **Managed** tab. You will see the computer listed as a managed computer under the Managed Computers tree node. Press the refresh button in the toolbar (or press F5) to see the client's current status.



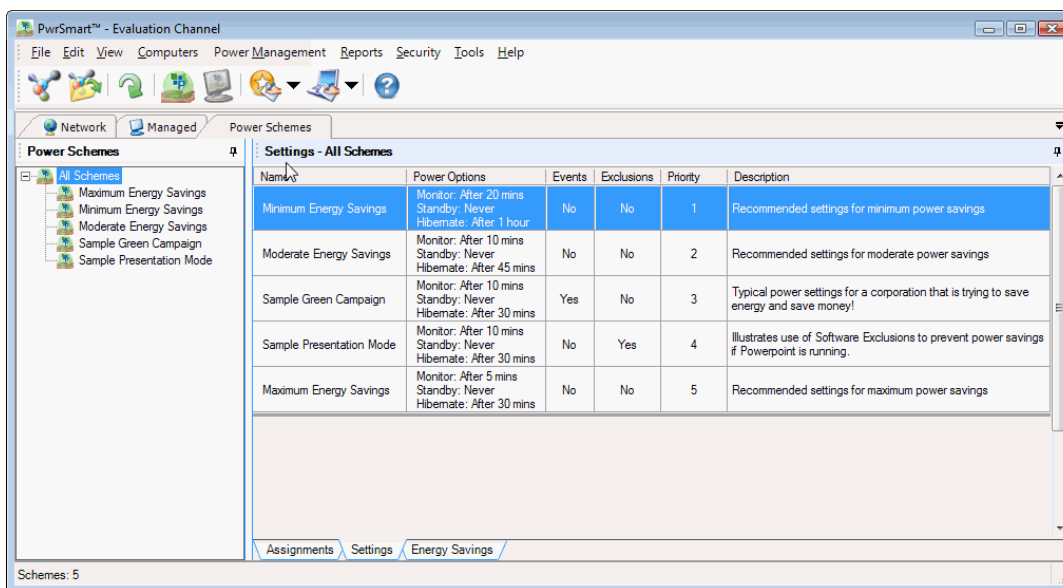
At this point you have a single managed computer in your channel. During evaluation of PwrSmart, you can add up to 25 workstations to the console.

Power Schemes

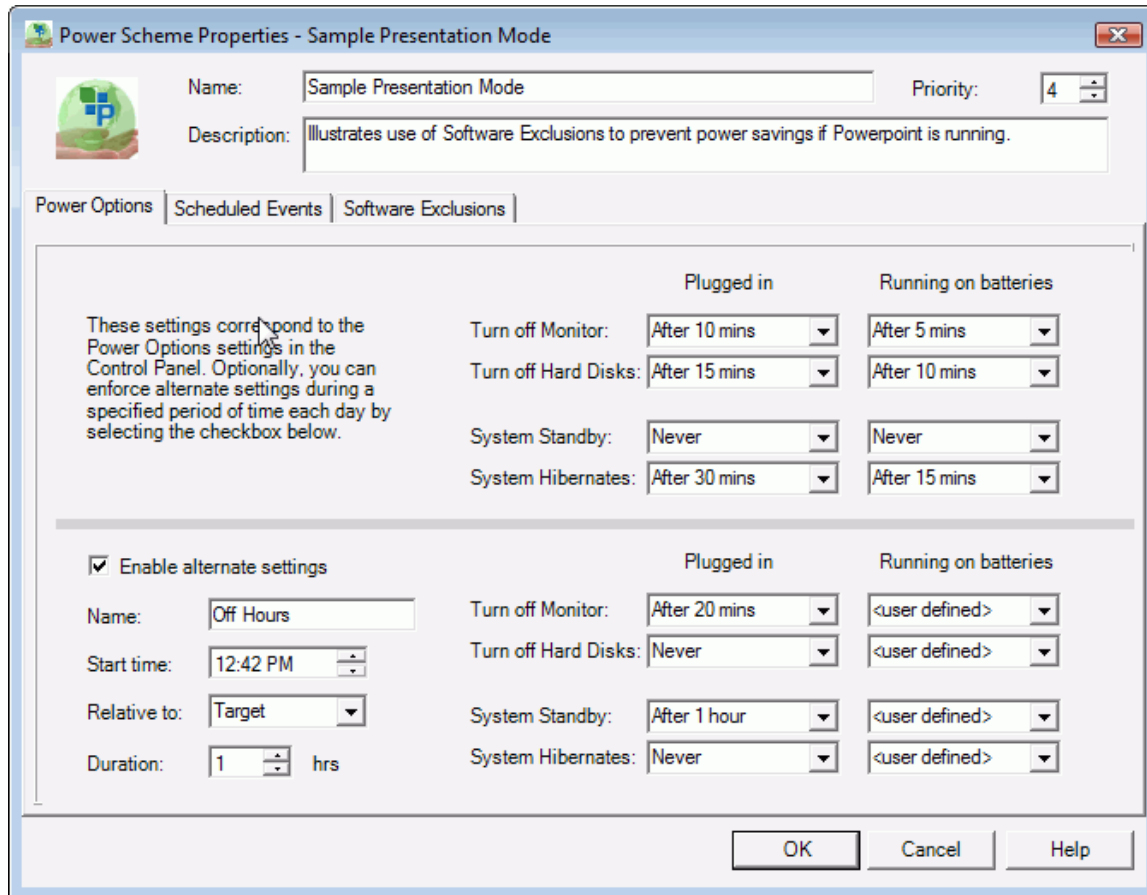
Power Schemes Overview

To see the preinstalled power schemes, click on the **Power Schemes** tab. The Evaluation channel includes 5 schemes:

- Minimum Energy Savings
- Moderate Energy Savings
- Maximum Energy Savings
- Sample Green Campaign - has wakeup and shutdown events defined; has an alternate settings period defined.
- Sample Presentation Mode - has a software exclusion defined for PowerPoint.



To see the details of a power scheme, right-click on the Sample Green Campaign scheme, then choose *Properties*. You'll see the three components that make up the power scheme: Power Options, Scheduled Events and Software Exclusions.



Power Options settings define how much idle time must occur before the displays and disks turn off or the computer goes into a low power state (standby or hibernate). The settings are similar to what you see in Windows Control Panel | Power Options. All of these settings are configurable. The settings in the Sample Green Campaign are fairly typical and would allow you to see some real energy savings.

Note that the Sample Green Campaign scheme has the **Enable alternate settings** box checked. By checking this box, you can set more aggressive power settings for after hours. Again, the alternate period start time and duration are configurable, as are the power settings. If you decide that you just want to enforce the same power scheme 24x7, simply uncheck the Enable alternate settings box.

Scheduled Events can be used to force machines to shutdown or hibernate at a particular time, or to wake up at a particular time, or to stay awake for a specified period of time. The Stay Awake event allows IT administrators to temporarily override other power management actions in order to patch, update, scan, or back up PCs on a predetermined schedule. Another use for a Stay Awake event is to give users a block of time when they can remotely access their workstations before their PCs go into a scheduled hibernation time.

Software Exclusions allow you to configure PwrSmart to not to process any power management settings or events if a specified application is running. Only configure an exclusion if there is some highly critical process that can't be interrupted. Be careful not to specify an application that users typically leave open most of the time (for example, outlook.exe or winword.exe), because that would reduce your energy savings.

Here are some choices you can make about how to use the provided Power schemes:

1. Use one of the power schemes as provided without making any changes to it;
2. Change the setting for turning off the monitor or hard disks, or change the standby and hibernate settings.
3. Configure some power management events (wake, hibernate, shut down, stay-awake, etc.)
4. Configure some process exclusion settings.
5. Create a completely new power scheme.

Assigning Power Schemes

It's easy to assign Power Schemes to computers or groups (see *Using PwrGroups* or *Using Organizational Groups* for more information about groups)

1. Go to the Managed tab.
2. Select the target computer or group.
3. Select the All Schemes subtab.
4. Select the desired scheme by doing one of the following:
 1. Use the Assign Scheme menu option (by right-clicking or using the Power Management menu) to open the Assign Scheme dialog.
 2. Double-click the scheme.
 3. Select the scheme and press the Assign button
 4. Select the scheme and press the icon in the toolbar.

When a computer is assigned a scheme, PwrSmart will apply that scheme on that computer. The computer's Power Options Control Panel will show the scheme name and the settings defined for that scheme. If the user changes the values, PwrSmart will set them back.

Unassigning a Scheme

There are several options for unassigning a scheme:

1. From the All Schemes subtab:
 1. Select the target computer or group
 2. Either:
 1. Open the Assign Scheme dialog; or
 2. Select scheme to unassign, and either click the Unassign button or double-click on the scheme.
2. From the Assignments subtab on the Power Management tab:
 1. Select the scheme to be unassigned.
 2. Select the assignment.
 3. Right-click and select Delete Assignment.

Targeting Computers for Power Management

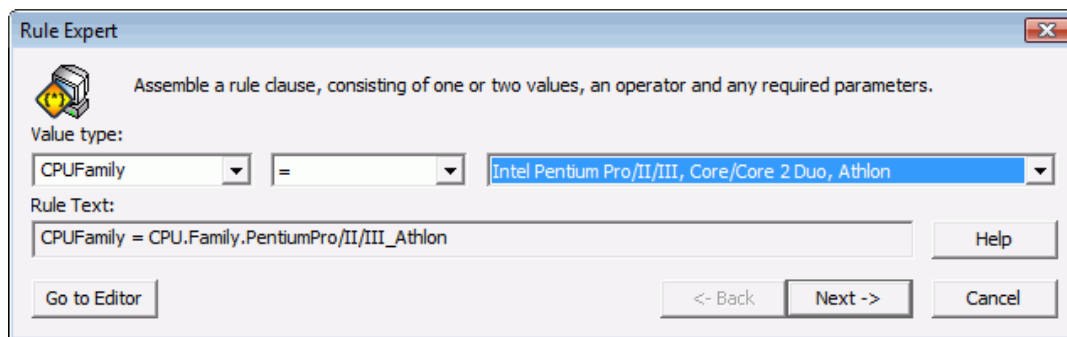
Using PwrGroups

PwrSmart gives you several ways dynamically target and group computers with similar power management requirements so that you can standardize and fine-tune PC power management across your organization. Let's look at PwrGroups first.

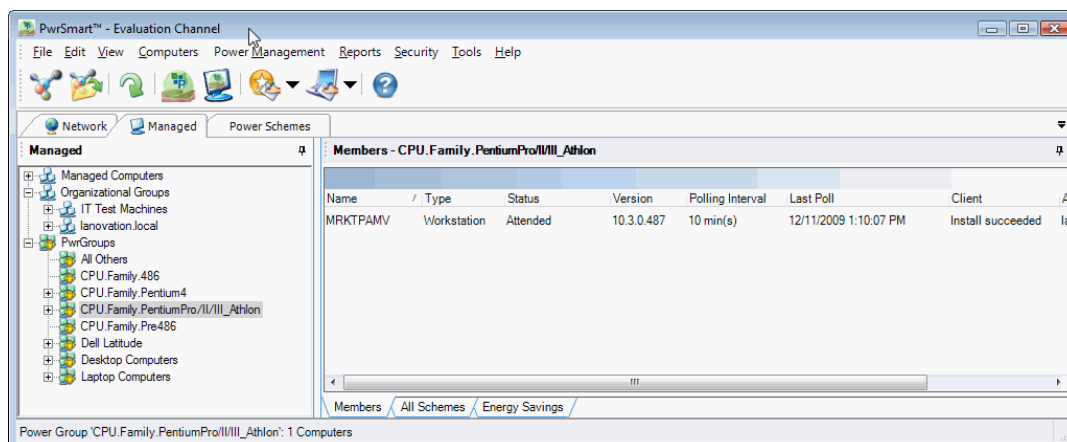
PwrGroups are based on New Boundary Technologies' patented Smart Update technology, and they allow dynamic, automated and highly-specific grouping of managed computers for very precise power management. Two PwrGroups are included with PwrSmart: Desktop Computers and Laptop Computers. As soon as you add computers to PwrSmart, they will automatically join either the Desktop or Laptop group - you didn't need to do anything else!

Laptop and Desktop groups are just a start. Perhaps you want to target power scheme assignment based on some other criteria, for example CPU family. Here are the steps:

1. Right-click on PwrGroups in the tree view of the Managed tab, and choose *Create Group*.
2. In the Rule Expert dialog, choose CPUFamily from the drop-down list. Next choose "=" as the operator, and choose "Intel Pentium Pro/II/III, Cor/Core 2 Duo, Athlon" from the last drop-down list.



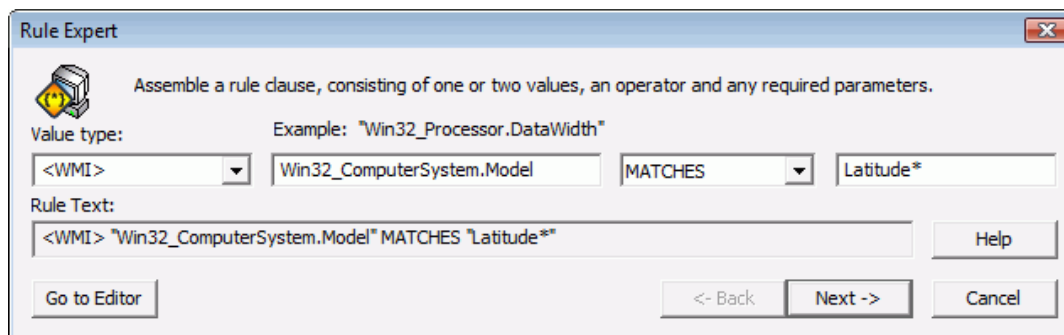
3. Click *Next*, *Next* and *Finish*.
4. Repeat these steps to create a couple more PwrGroups for different CPUFamily choices, such as 486, Pentium 4 or Athlon 64, Itanium (IA-64), etc.



As the managed computers communicate with the PwrSmart server, they will join the appropriate CPUFamily PwrGroup - automatically! You can then assign different power schemes to the various CPUFamily groups. If a new computer is added to PwrSmart, it will join the appropriate CPUFamily PwrGroup, and it will get whatever scheme is assigned to that group.

Try creating a more advance PwrGroup. Let's use WMI to find all the computers that are in a certain model category, for example all Dell Latitude computers.

1. Right-click on PwrGroups in the tree view of the Managed tab, and choose *Create Group*.
2. In the Rule Expert dialog, choose <WMI> from the drop-down list. In the next box enter Win32_ComputerSystem.Model. Next choose "MATCHES" as the operator, then type Latitude* in the last box.

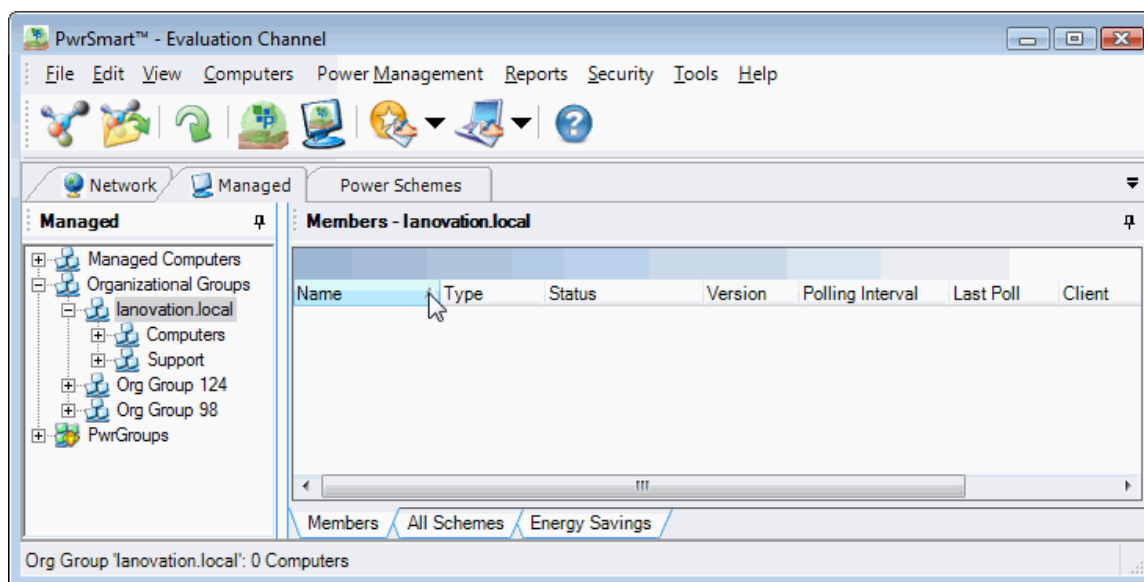


3. Click *Next*, *Next* and *Finish*.

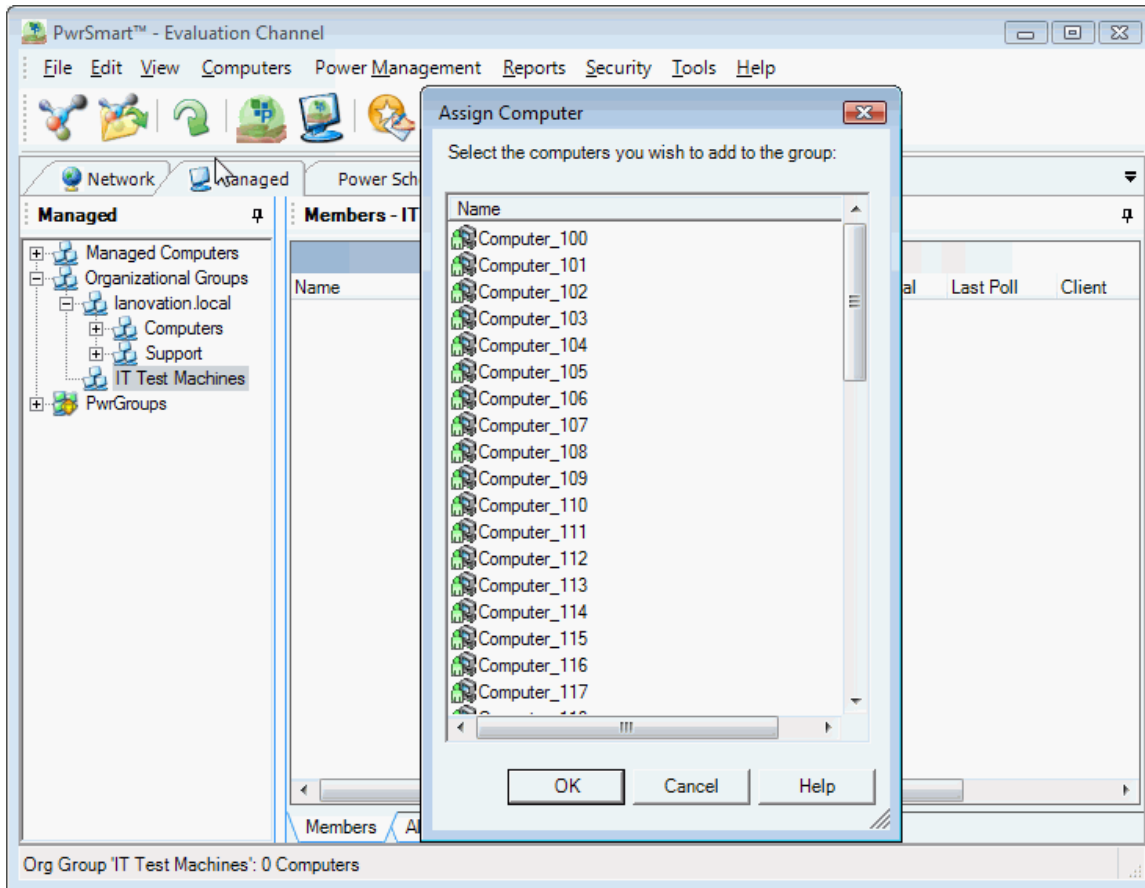
As the managed computers communicate with the PwrSmart server, any of them that are Dell Latitude model will join the PwrGroup.

Using Organizational Groups

Organizational Groups automatically reflect the Active Directory structure of your organization. When a managed computer first communicates with the PwrSmart server, it reports its Active Directory OU membership, and it creates and joins the appropriate folder under Organizational Groups. If the computer is moved to a different OU in Active Directory, that change will be reflected in the Organizational Groups folder structure.



Organizational groups can also be created manually. Manually created organizational groups may reflect functional groups or roles within your organization that aren't reflected in the Active Directory structure. Since they are maintained manually, these groups are most useful for smaller numbers of managed computers or populations that remain constant. To create a group manually, simply right-click on the Organizational Groups tree and choose *Create Group*. Give the group a name and click *OK*. To add computers to the group, right-click on it and choose *Add to Group*. You can then select or multi-select computers from the list.



Calculating Power Savings

Calculating Power Usage Baseline

Before beginning an evaluation of PwrSmart, it's important to get a picture of what the energy usage of your managed computers currently is. There are a couple ways you can do that

Serial option

- 1 group of computers
- Collect data for one week while no power schemes are assigned. Run the built-in Energy Savings calculator to cover the 1st week period.

- At the end of the 1st week, assign one of the EPA-recommended PwrSmart™ power schemes. At the end of the 2nd week, again run the Energy Savings calculator to cover the 2nd week period.

Parallel option

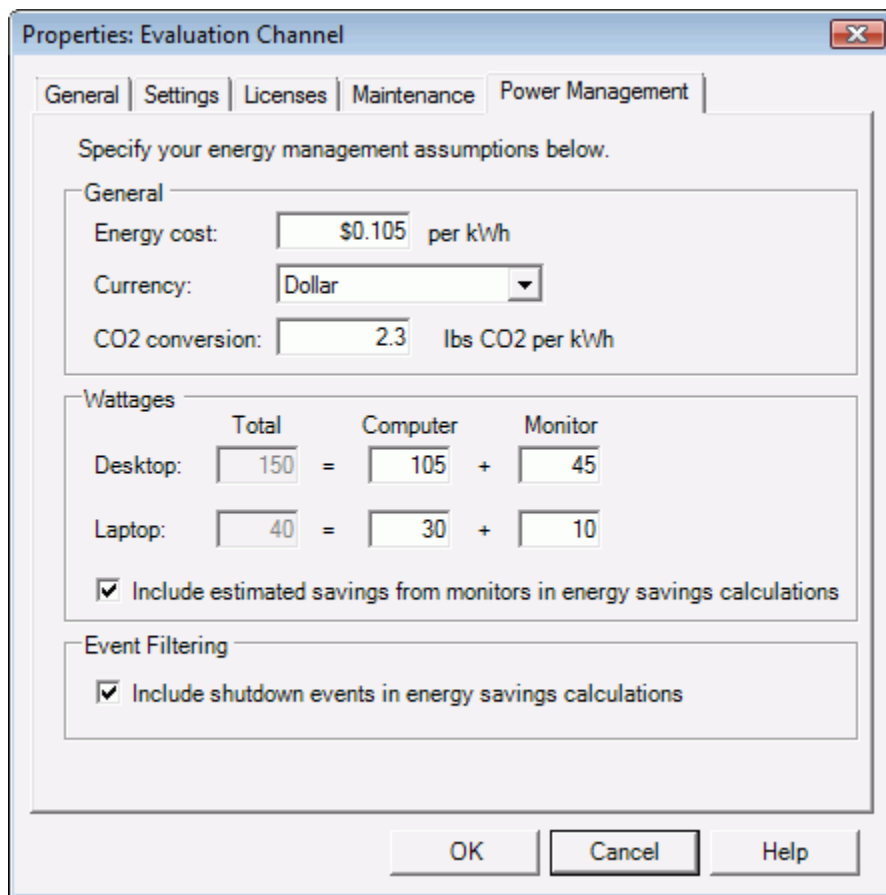
- 2 groups of computers with similar hardware and similar usage patterns
- 1st group is the control – no power settings are assigned.
- 2nd group is the test – assign one of the power schemes to this group.
- After one week, compare Energy Saving between two groups of computers.

Modifying Calculator Assumptions

Use the Channel Properties | Power Management tab to define assumptions for energy management calculations.

Note Changing assumptions will delete all of the current energy savings calculations.

This dialog box is displayed when you choose File | Channel Properties then click on the Power Management tab. It also opens when you select Assumptions from the Power Management menu or by pressing the button on the Energy Savings tab.



General

- Energy Cost: Enter the cost per kWh to be used in energy savings calculations. This will vary by country and region as well as time of year.

- Currency: Select the currency to use for energy savings calculations.
- CO2 conversion: Enter the CO2 conversion factor. This is primarily a function of the energy source use in your region. For example, natural gas might be 0.185 kg/kWh, while industrial coal is 0.330 kg/kWh. The units are kilograms except in the U.S., where the units are pounds ("lbs").

Wattages

In this area, you specify the average wattage consumed for desktops and laptops, and, if desired, monitors. All desktop computers in your channel will be assumed to have the specified desktop wattage, while all laptops are assumed to have the specified laptop wattage.

Event Filtering

This section defines what events will and will not be included in the energy savings calculations. There are two types of events recorded by PwrSmart: shutdown events and standby events. The latter events are either hibernate or standby events.

Note In addition to this option, PwrSmart automatically filters out all events of short duration (less than 4 minutes). Such events do not contribute noticeably to energy savings, and often indicate that a machine tried to enter a standby state but was unsuccessful for some reason.

Using the Energy Savings tab

Using the Energy Savings tab, you can determine how much energy has been saved in a specific group or by a specific power scheme. The results include projected annualized savings, as well as annual savings per computer, which allows you to compare savings across groups and across schemes.

To calculate savings for a:

- Computer or group: Select the Managed tab and then the Energy Savings subtab.
- Power scheme: Select the Power Management tab and then the Energy Savings subtab.

Energy savings is computed based on the energy savings log. The energy savings log is a database log containing all occurrences of energy related events (shutdown events, standby events, etc.) across all managed machines. You can view this data in the Report | Computer Reports | Energy Savings report. Each entry includes the computer's ID, the event type, the off and on times, and the scheme active on that computer at that time.

Setup Panel

Date Range

In this area, specify the time range over which you wish to calculate energy savings. The range you pick depends on your objective, when schemes were applied, when computers joined the group, etc.

Time span: The time span can be specified in two ways:

1. **Last....:** This will extract the specified duration of data going back from mid-day of the current day.
2. **... starting:** This will extract the specified duration of data starting from the date specified using the calendar control.

Note The database records available for analysis will depend on the settings defined in the Channel Properties | Maintenance tab. For example, if in the Maintenance tab you specify that only 30 days of data should be retained, then you can only calculate savings up to 30 days in the past.

Calculate Savings: Press this to calculate savings over the specified date range. The Results panel will be updated accordingly. The calculation can be done on any of three sources:

1. A computer: Only energy savings log entries involving the specified computer are included in the analysis.
2. A group: Only energy savings log entries involving computers currently belonging to the selected group are included in the analysis.

Note Groups can dynamically change their membership. Therefore, take care in interpreting the analysis results for highly volatile groups.

3. A scheme: Only energy savings log entries involving the specified scheme are included in the analysis.

Assumptions: Press this to open the Channel Properties | Power Management tab. This is where you specify assumptions such as cost of energy and device wattages. Changing the assumptions will cause the Results panel to be refreshed. However, all previously generated results (associated with other targets or other date ranges) will be deleted. The assumptions influence the energy savings calculations. They define the types of events to include and how much energy to associate with each event.

Results Panel

This is where the results are shown after pressing the Calculate Results button or changing assumptions.

Actual Savings

This area displays the actual savings over the time range specified based on the specified assumptions.

Projected Savings

These are projected annualized savings based on time range reflected in the actual data. For example, if the actual time span of the dataset is 30 days, the annualized values will be approximately 12 times the actual values.

In addition, the Annual savings per computer is shown. It is the annualized cost savings divided by the number of computers sampled.

Tip The annual savings per computer is a normalized value (normalized by time and computer count) and hence is the best value to use for comparisons among groups and schemes.

Dataset Analysis

This area displays information about the data actually sampled.

- **Actual start date:** The earliest date found in the sampled energy savings logs. This date may be later than the start date specified by the Time span setting in the Setup panel, depending on the actual events recorded.
- **Actual end date:** The latest date found in the sampled energy savings logs. This date may be earlier than the end date specified by the Time span setting in the Setup panel, depending on the actual events recorded.
- **Actual time span:** The difference between actual start and end dates.
- **Computers sampled:** The actual number of computers in the sampled energy savings logs. This may be less than expected for the selected target:
 - **Computer:** This will be 0 if there are no log entries for that computer over that time, either because the computer did not have a scheme assigned, or did not have any energy saving events, or those events were filtered out of the results.
 - **Group:** This will be between 0 and the number of computers currently in the group. It may be less than the number of computers in the group if the group does not have a scheme assigned and only some of the computers have a scheme assigned directly or via another group (see Tip below).
 - **Scheme:** This will can be any number, depending on how many computers were running that scheme and made log entries during the specified time range.

Tip Use the Computer Power Schemes Energy Savings Report to determine:
- For a group, how many computers in that group are actively applying a scheme;
- For a scheme, how many computers are actively applying that scheme.
- Refer to Energy Savings Reports for more information.

Save and Analyze

- Export: Exports the analysis to a text file.
- Compare: Opens the Compare Energy Savings Analyses dialog, which allows you to compare 2 different energy savings calculations.

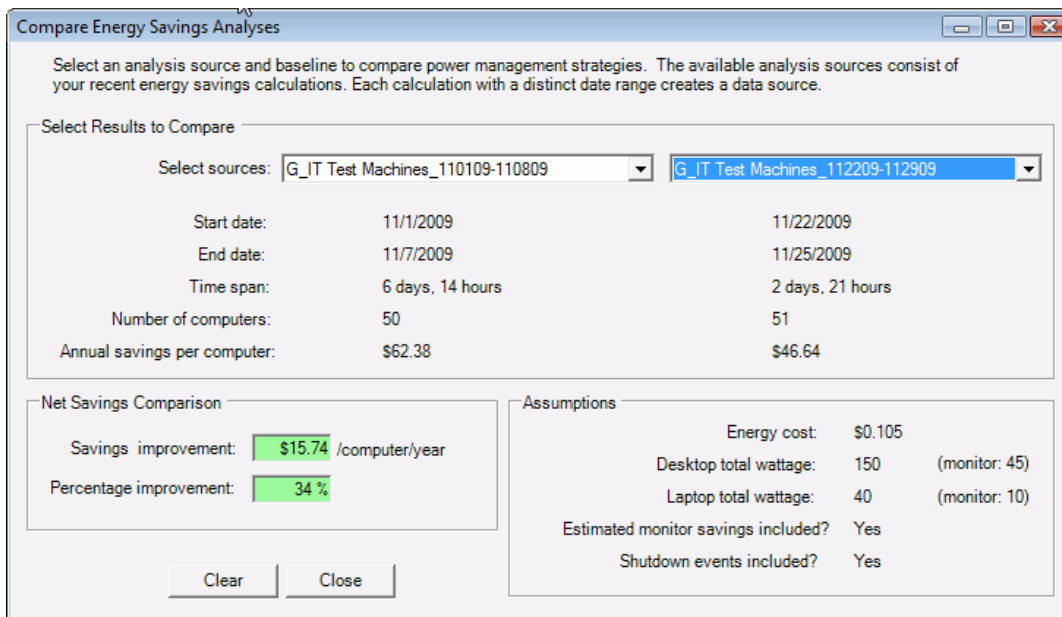
Print

- Print: Print the current analysis.
- Preview: This displays the print preview dialog for the current analysis. You can print directly from this dialog.

Comparing Energy Savings for a Single Group During Two Time Periods

1. On the Managed tab, click on the group you want to use for the comparison. It can be a PwrGroup or an Organizational Group.
2. Click on the bottom tab called Energy Savings.
3. In the Setup section at the top of the Energy Savings tab, select the first date range, for example 1 week beginning December 6.
4. Click the Calculate button.
5. Now change the data range to select the next week of data, for example 1 week beginning December 13.
6. Click the Calculate button again. You now have 2 sets of data to compare.
7. Click the Compare button. In the dialog that opens, you can choose the two sets of data to compare.

Note The notation G_ means group and C_ means computer (you can also look at energy savings on a single computer).



Compare Energy Savings for Two Groups in a Single Time Period

1. On the Managed tab, click on the group you want to use for the first part of the comparison. It can be a PwrGroup or an Organizational Group.
2. Click on the bottom tab called Energy Savings.
3. In the Setup section at the top of the Energy Savings tab, select the time period you want to use.
4. Click the Calculate button.
5. Now click on the group you want to use for the second part of the comparison. Make sure the same time period is selected
6. Click the Calculate button again. You now have 2 sets of data to compare.
7. Click the Compare button. In the dialog that opens, you can choose the two sets of data to compare.

Note: The notation G_ means group and C_ means computer (you can also look at energy savings on a single computer).

Compare Energy Savings Analysis

Select an analysis source and baseline to compare power management strategies. The available analysis sources consist of your recent energy savings calculations. Each calculation with a distinct date range creates a data source.

Select Results to Compare

Select sources: G_IT Test Machines_111509-121509 G_Laptop Computers_111509-121509

Start date:	11/15/2009	11/30/2009
End date:	12/10/2009	12/10/2009
Time span:	25 days, 2 hours	9 days, 14 hours
Number of computers:	52	1
Annual savings per computer:	\$24.01	\$7.83

Net Savings Comparison

Savings improvement: **\$16.18** /computer/year

Percentage improvement: **207 %**

Assumptions

Energy cost:	\$0.105
Desktop total wattage:	150 (monitor: 45)
Laptop total wattage:	40 (monitor: 10)
Estimated monitor savings included?	Yes
Shutdown events included?	Yes

Clear Close

Review

In this tutorial, you have:

- Install PwrSmart;
- Familiarized yourself with the console;
- Managed a computer;
- Learned about the three components of power schemes;
- Created or modified a power scheme;
- Assigned a power scheme;

- Seen PwrGroups and Organizational Groups in action;
- Calculated and analyzed your actual and projected energy savings.

Getting Help

Documentation

In addition to this Tutorial, the following documentation is available to help you with Policy Commander:

- **PwrSmart Help:** This is the user's guide for PwrSmart. It is available via the Help menu in the console, and is also available as a PDF via download from <http://www.newboundary.com/support/rcenter.htm>

- **Technical Support**

If you are unable to locate answers to your questions about PwrSmart from the available documentation, please use the following resources to receive assistance:

- **Web site:** www.newboundary.com -- Here you will find the online New Boundary Technologies Support Forum, knowledge base articles, and responses to frequently asked questions.
- **Phone:** 800-747-4487
or 612-379-1851
Available 8:30 a.m. to 5:00 p.m. Central Time, Monday through Friday
- **Email:** support@newboundary.com