

Scheduling Automated Outlet Control Using FineSNMPSet with Sentry Switched Power Distribution Units

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Purpose

This technical note provides a brief overview and the detailed instructions for automating SNMP Set commands from a networked Microsoft® Windows PC to Server Technology's Sentry switched power distribution units for scheduled and automatic outlet control.

Overview

Scheduling automated outlet control requires the following items:

- FineSNMPSet free-ware utility program
- Windows Scheduled Tasks
- Sentry SNMP support
- Sentry Switched® Cabinet Distribution Units (CDUs) or other Sentry Remote Power Managers.

A brief description for each item is provided next, followed by detailed instructions, examples, and reference information.

FineSNMPSet Free-Ware Utility

FineSNMPSet is a free-ware utility program developed by FineConnection that may be used to set an arbitrary SNMP object to a specific value. FineSNMPSet is easy to use – no installation is required, no DLL files are used, and no other software is required.

The FineSNMPSet utility program (**FineSNMPSet.exe**) uses command-line parameters and issues an SNMP Set command. For remote controlling of outlets on a Sentry Switched power distribution unit, the SNMP commands created address one outlet at a time and instruct the outlet to turn Off, turn On (by default outlet is on), or Reboot (off, delay, on). A batch file may be created to address multiple outlets by executing multiple instances of FineSNMPSet commands.

Windows Scheduled Tasks

Standard installations of the Windows operating system provide the Windows Scheduled Tasks feature to let you schedule a program to run at a time that is most convenient for you. Scheduled Tasks runs in the background and starts each time the Windows operating system starts. Scheduled Tasks allows batch files containing FineSNMPSet commands to be executed automatically based on daily, weekly, and monthly schedules. In addition, a repeating schedule may also be defined.

Sentry SNMP Support

Sentry switched power distribution units support a comprehensive set of features using SNMPv2. SNMP traps may be sent to two destinations, SNMP Get commands may be used to query or poll the Sentry unit for information about an SNMP object, and SNMP Set commands may be used to set an SNMP object to a specified value. This Technical Note addresses Set commands appropriate for remote power control.

To identify the variety of Sentry SNMP objects that may be Set, see the **Sentry3OIDTree.txt** file located at: <ftp://ftp.servertech.com/pub/SNMP/sentry3/>

Note: Although not required for this Technical Note, a **Sentry3.mib** file may also be found at the same FTP location (directly above) to provide additional information about the SNMP features available in the Sentry system.

Instructions

The following step-by-step instructions accomplish automated outlet control using FineSNMPSet.

Before You Begin

Ensure the following assumptions are in place before starting the automated outlet control process:

- A folder named "Sentry" has been created directly off the root drive and the FineSNMPSet utility and subsequent batch files are located in the "Sentry" folder.
- Each Sentry switched power distribution unit has been installed on the network, has been assigned a static IP address, and is accessible by a web browser.
- For more information and instructions, refer to the applicable Installation and Operations Manual at www.servertech.com for the Sentry unit.
- SNMP settings in the Sentry unit are at their default settings. Of primary importance is the Set Community string which should be set to "Private", and the IP Restrictions field which should be set to "No Restrictions".

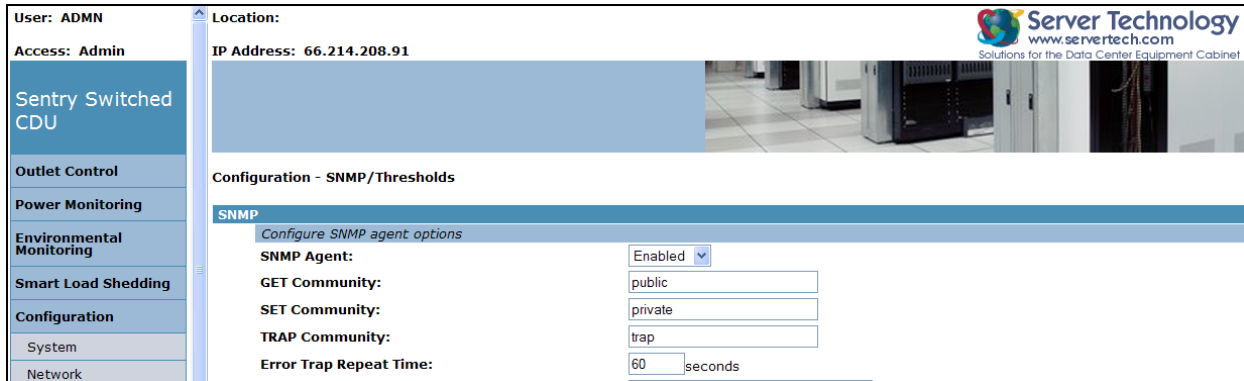
Note: Screen samples in this document may vary depending on your Sentry product.

Obtain the FineSNMPSet Free-Ware Utility

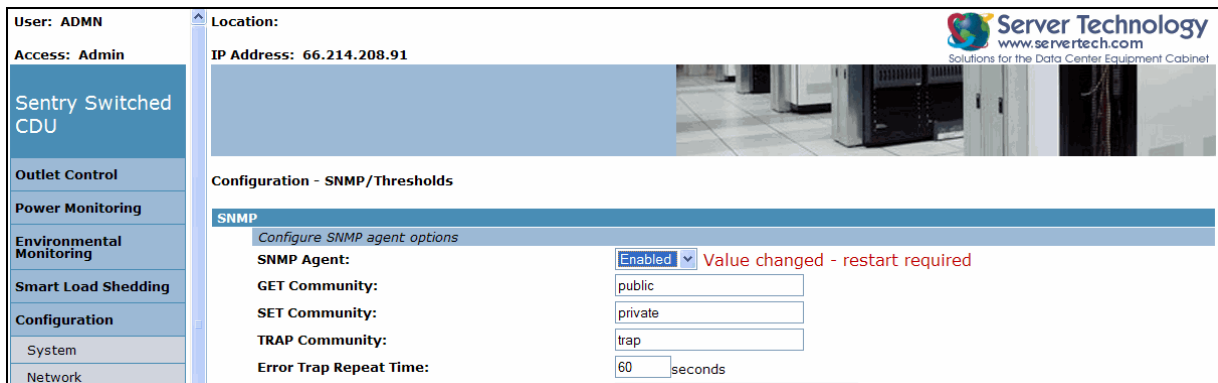
1. Download the FineSNMPSet utility at: <http://www.fineconnection.com/SNMPSet> and place it in the "Sentry" folder you created directly off the root drive.

Configure the Sentry Unit to Enable SNMP

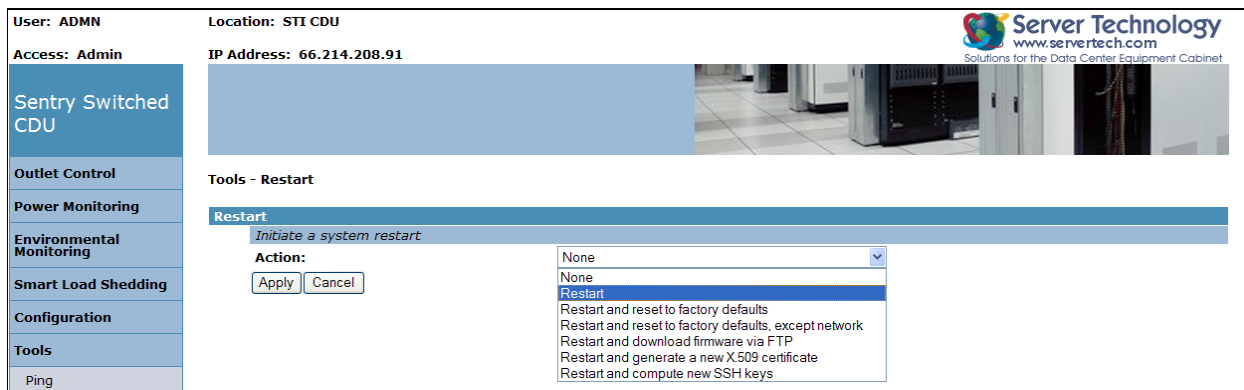
2. Login to the Sentry unit as an Administrator and use the menu links in the left pane of the Web interface to navigate to the **Configuration > SNMP/Thresholds** page, as follows:



3. From the SNMP Agent drop-down list, select the Enabled option (shown above) and click **Apply**. The message "Value changed – restart required" displays:



4. To perform the restart, navigate to the **Tools > Restart** page:



5. Click the drop-down list arrow to display a list of options, select the Restart option, and click **Apply**. When the message "Are you sure" displays, click **OK**. Wait about one minute for the system to restart. Outlets remain in their last state as the system restarts.

Note 1: The **FineSNMPSet.exe** utility program should exist in the C:\Sentry folder (created off the root directory) and the Sentry unit should be ready to accept SNMP Set commands.

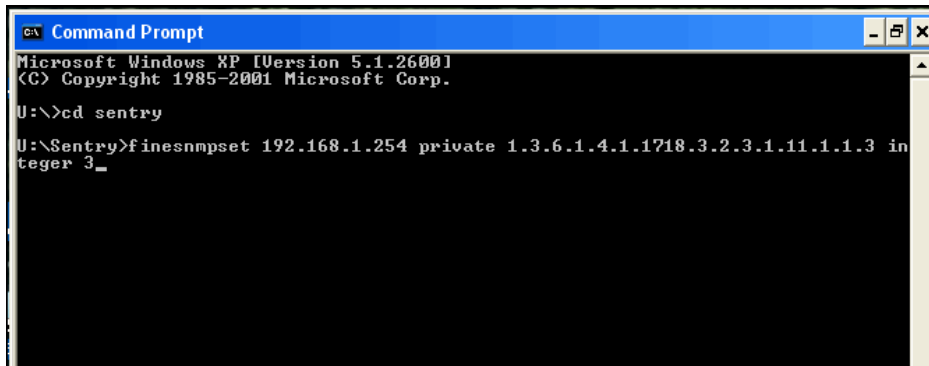
Note 2: For the remainder of this Technical Note, the examples used are valid for a Sentry Switched CDU (model CW-16V1-C20). The commands are generic for nearly all Sentry models but further verification of the Object Identification Tree (OIDTree) may be needed for other units and combinations of units.

Verify FineSNMPSet

- To quickly verify that FineSNMPSet can successfully send instructions to the Sentry unit, proceed to a Windows command prompt, change to the C:\Sentry directory (where **FineSNMPSet.exe** is located), and issue the following command:

```
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.1 integer 3 <Enter>
```

Where "xxx.xxx.xxx.xxx" is the IP address assigned to the Sentry unit, shown as follows at the command prompt:



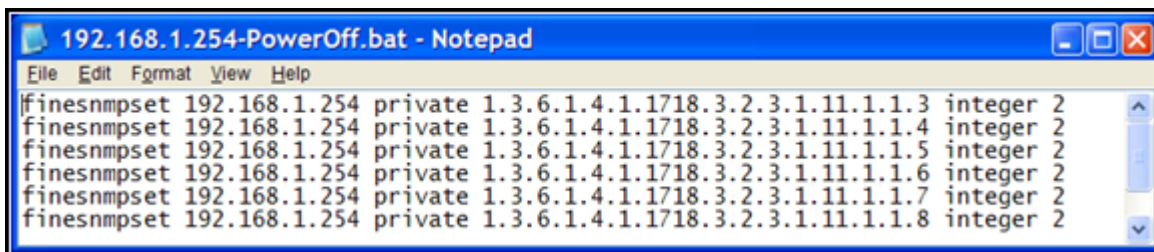
```
Command Prompt
Microsoft Windows XP [Version 5.1.26001
(C) Copyright 1985-2001 Microsoft Corp.

U:\>cd sentry
U:\Sentry>finesnmpset 192.168.1.254 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.3 in
teger 3_
```

When pressing <Enter>, the FineSNMPSet utility program should send a command that instructs Outlet 1 to reboot. Based on the default settings, the outlet should turn off, remain off for 15 seconds, and then automatically power back on. If successful, you are ready to begin constructing batch files that contain FineSNMPSet commands for specific objectives.

Create Batch Files

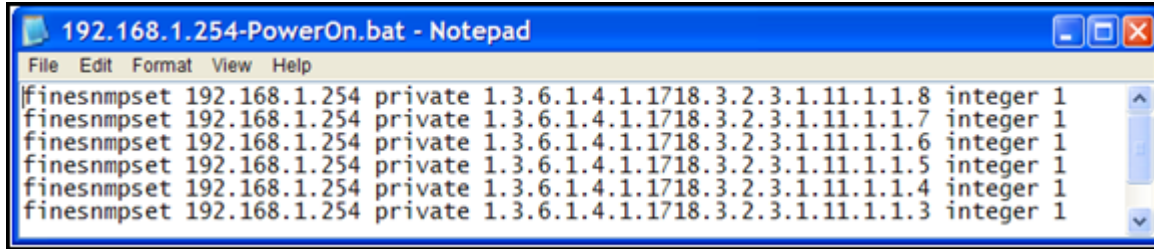
- Batch files contain multiple lines of the FineSNMPSet command to address multiple outlets from one instance. Using the text editor of your choice (for example Notepad or the MS DOS Editor), you may create batch files with the appropriate FineSNMPSet commands for state changes of outlets. Open the text editor and follow the steps below. (Notepad was used for the following two batch file examples.)
- For the first batch file: type the following commands to power the outlets off, then save the file:



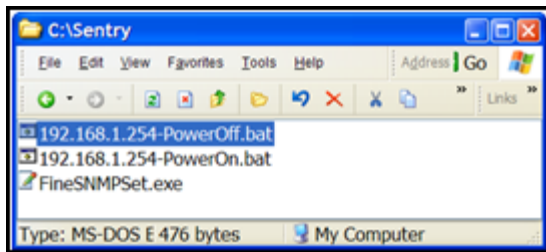
```
192.168.1.254-PowerOff.bat - Notepad
File Edit Format View Help
finesnmpset 192.168.1.254 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.3 integer 2
finesnmpset 192.168.1.254 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.4 integer 2
finesnmpset 192.168.1.254 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.5 integer 2
finesnmpset 192.168.1.254 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.6 integer 2
finesnmpset 192.168.1.254 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.7 integer 2
finesnmpset 192.168.1.254 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.8 integer 2
```

Note 1: Save the batch files with the .bat extension.

- For the second batch file: type the following commands to power the outlets on, then save the file:



Two following two batch files were created with descriptive names, and when executed, the files use FineSNMPSet to instruct the specified outlets to power off and on.



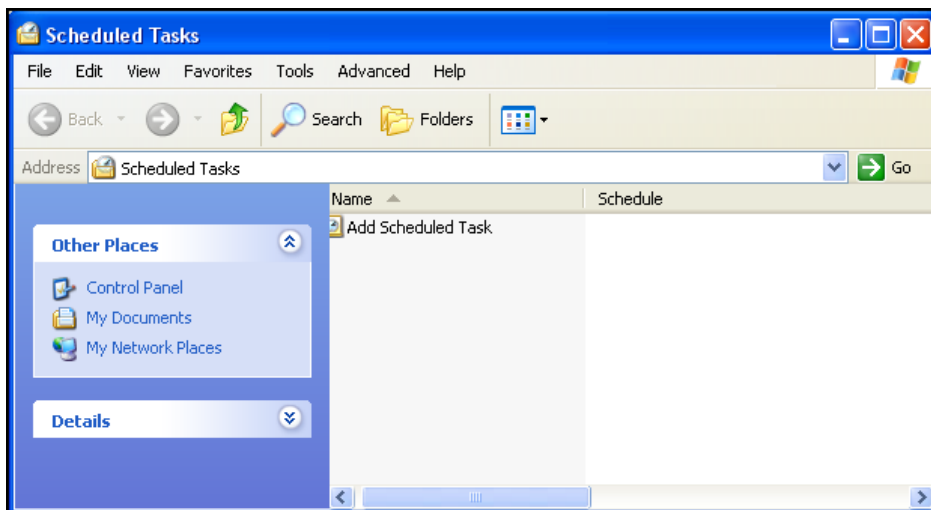
- Make sure the batch files are saved in the same Sentry folder with the **FineSNMPSet.exe** program, as shown above.

Define Windows Scheduled Tasks

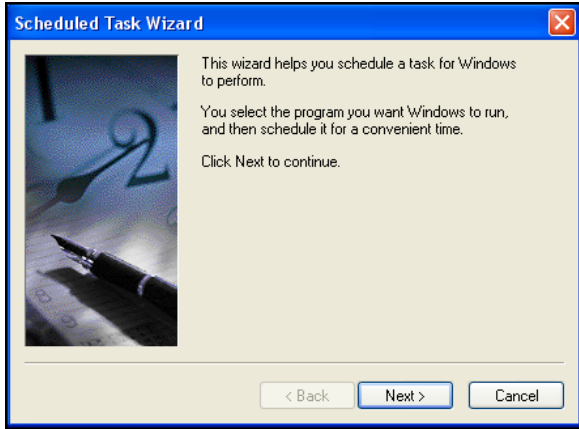
- Define scheduled tasks using the Windows Scheduled Tasks feature to execute the batch files by a schedule. Launch the Windows Task Scheduler at:

Start > All Programs > Accessories > System Tools > Scheduled Tasks

The Scheduled Tasks window displays:



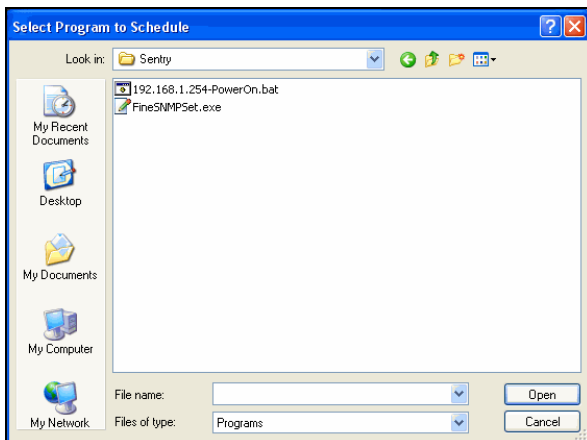
12. Double-click on Add Scheduled Task (shown above) to launch the Scheduled Task Wizard:



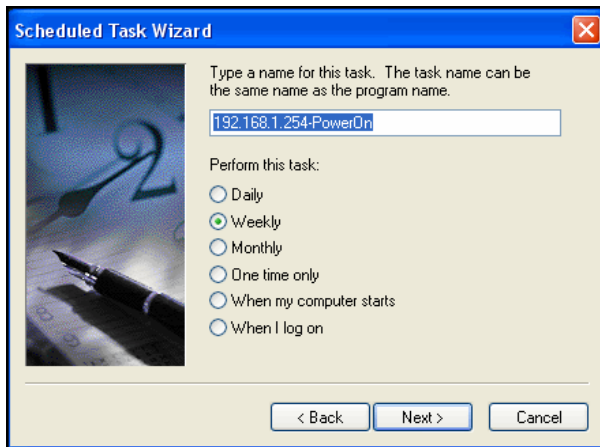
13. Click **Next**. The Scheduled Task Wizard displays showing a list of applications, as follows:



14. Click **Browse** to locate the batch files (for example, locate **192.168.1.254-PowerOn.bat**) in the C:\Sentry directory:



15. Select the **192.168.1.254-PowerOn.bat** file (example shown above) and Click **Open**. The Scheduled Task Wizard displays showing frequency options:



16. The **192.168.1.254-PowerOn.bat** filename appears as a task (shown above). The name may be changed.

17. Select a frequency from the option buttons listed, such as Daily, Weekly, One time only.

18. Click **Next**. The Scheduled Task Wizard displays showing time and date options, as follows:



19. Set the time, frequency, and start date for the task to start (shown above) and click **Next**. The Scheduled Task Wizard displays showing user name, password, and confirm password options:



- Enter the appropriate user name, password, and confirm password (shown above) and click **Next**. The Scheduled Task Wizard displays a successful message with the option to finish the task:

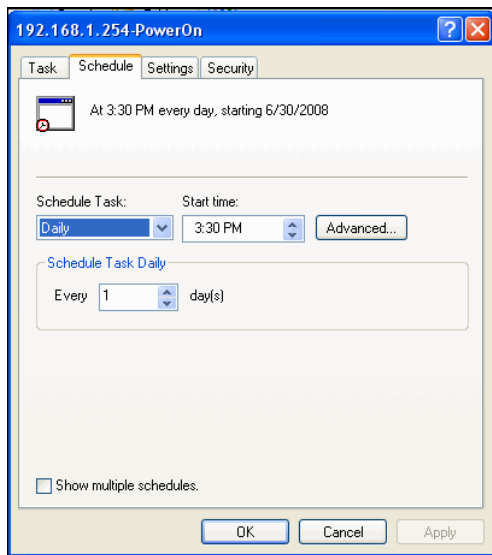


- To create the scheduled task, click **Finish**. The task is executed at the specified time and Outlet 1 will reboot accordingly.

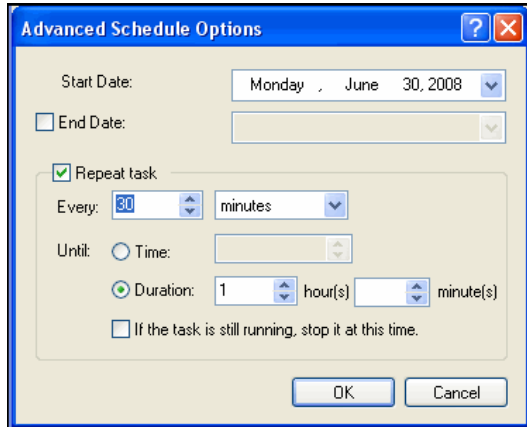
Use Advanced Scheduling Properties (Optional)

The Advanced Scheduling Properties feature allows you to set repeat times for the scheduled task.

- On the Scheduled Task Wizard window (previous screen image), check the checkbox titled “Open advanced properties for this task when I click Finish”, then click the **Finish** button. The Advanced Scheduling Properties window displays:



- The tabs in this window (shown above) allow the setting of repeat times for a scheduled task. For example, if you want to reboot Outlet 1 every hour, select the Schedule tab and click the **Advanced** button to choose repeat options:



- Check the “Repeat task” checkbox (shown above) and set the task to repeat every 60 minutes.
- Click **OK** then click **Apply** to finalize the settings. The Windows Task Scheduler automatically sends the FineSNMPSet reboot command for Outlet 1 every hour.

FineSNMPSet Command Syntax

The complete syntax for the FineSNMPSet command (specific to power control of Sentry devices) is:

```
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.a.b.c integer y <Enter>
```

where:

“xxx.xxx.xxx.xxx” is the IP address assigned to the target Sentry unit.

“private” is the Set Community string for the CDU.

“1.3.6.1.4.1.1718.3.2.3.1.11.” is the CDU Object ID (MIB OID) for a specific outlet. The MIB OID is downloaded at: <ftp://ftp.servertech.com/pub/SNMP/sentry3/>

“a” identifies the Sentry enclosure identification: “1” (for master unit) or “2” (for expansion unit).

“b” identifies the input power feed of the unit: “1” (for infeed-A) or “2” (for infeed-B).

“c” identifies the outlet to be controlled: “1” through “16” (1-16).

“integer” is a literal parameter.

“y” is the power command: “1” (to turn On), “2” (to turn Off), or “3” (to Reboot) the outlet.

Examples of Power Commands

The following examples show commands for controlling any of up to 16 outlets on a Sentry Switched CDU (model CW-16V1-C20) that has been assigned the IP address of 10.1.2.130:

Turn On Outlet 1: `finesnmpset 10.1.2.130 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.1 integer 1`

Turn Off Outlet 6: `finesnmpset 10.1.2.130 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.6 integer 2`

Reboot Outlet 16: `finesnmpset 10.1.2.130 private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.16 integer 3`

Examples of Scheduled Tasks

Example 1

Objective: Reboot all 16 outlets every hour. The following example shows the batch file content. Note that “xxx.xxx.xxx.xxx” must be replaced with the IP address of the target Sentry Switched CDU (model CW-16V1-C20).

The batch file content is:

```
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.1 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.2 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.3 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.4 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.5 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.6 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.7 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.8 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.9 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.10 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.11 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.12 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.13 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.14 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.15 integer 3
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.16 integer 3
```

1. Name the batch file with a descriptive name and save the file.
2. Create a Scheduled Task with an appropriate descriptive name, browse, select the correct batch file, set the start time and date accordingly, and use the Advanced Schedule Options to set the task to repeat every 15 minutes.

Example 2

Objective: Turn Off outlets 1-3 at IP address xxx.xxx.xxx.xxx and turn On outlets 9-11 of as second Sentry Switched CDU at address yyy.yyy.yyy.yyy every 15 minutes.

The batch file content is:

```
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.1 integer 2
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.2 integer 2
finesnmpset xxx.xxx.xxx.xxx private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.3 integer 2
finesnmpset yyy.yyy.yyy.yyy private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.9 integer 1
finesnmpset yyy.yyy.yyy.yyy private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.10 integer 1
finesnmpset yyy.yyy.yyy.yyy private 1.3.6.1.4.1.1718.3.2.3.1.11.1.1.11 integer 1
```

1. Name the batch file with a descriptive name and save the file.
2. Create a Scheduled Task with an appropriate descriptive name, browse, select the correct batch file, set the start time and date accordingly, and use the Advanced Schedule Options to set the task to repeat every 15 minutes.

Note: For Example 2, you may need another batch file to switch the first three outlets listed On and the last three outlets listed Off every 15 minutes. Otherwise, the scripted list will not change the outlet status the second time the script runs.

Additional Security Measures (Optional)

A variety of security features exists within the general SNMP protocol and Sentry switched power distribution systems. However, to increase security of SNMP interactions, use the following additional measures:

- Configure each Sentry unit with a unique "SET Community:" string. The default is "private".

Changing this string to something unique and secret requires the FineSNMPSet command for each unit be modified to contain a matching string.

- Configure each Sentry unit with an access control list such that the unit(s) will only accept SNMP commands or queries that come from an SNMP Manager (FineSNMPSet in this case) with a specific source IP address.

Each Sentry unit may be configured with up to two IP addresses for the SNMP Manager by entering the addresses in the "Trap Destination 1:" and "Trap Destination 2:" fields of the Sentry web interface (**Configuration > SNMP**). Enter the IP address of up to two systems that will send FineSNMPSet commands, then set the "IP Restrictions" field to "Trap Destinations Only", and click **Apply**.

↪ end

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