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Chapter 1

Introduction

The Powerware® Extensions tool for IBM® Director provides seamless integration of Powerware uninterruptible power systems (UPSs) into the IBM Director Console. As a part of the Eaton comprehensive family of power management applications, Powerware Extensions simplifies network management tasks for critical elements of server power protection. System administrators can easily monitor, diagnose, configure, set alarms, schedule self-tests, check battery conditions, gather inventory information, and control Powerware UPSs network-wide from the IBM Director Console.

With Powerware Extensions, users can simply double-click the UPSs integrated into the IBM Director interface and launch Powerware LanSafe® Power Management Software or ConnectUPS™ X-Slot™ Card applications. All the powerful features and functions of these Eaton award-winning applications are now just a click away through the IBM Director Console.

Features and Benefits

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seamless integration of UPSs into the IBM Director Console</td>
<td>Allows administrators to monitor UPSs on the network, in real-time, and obtain advance notice on critical elements of server power management, such as UPS battery status, load level, temperature, and alarms for battery replacement. Launch Powerware LanSafe Power Management Software and ConnectUPS X-Slot Card applications directly from within IBM Director. Maximize systems availability through the IBM Director user interface.</td>
</tr>
<tr>
<td>UPS inventory management</td>
<td>Perform UPS inventory queries network-wide. Create customized reports on UPS locations, models, serial numbers, firmware versions, equipment attached to UPSs, and other details.</td>
</tr>
<tr>
<td>UPS event and alarm management</td>
<td>Start programs, send e-mail, send messages to pagers, log to file, send to newsgroup, and initiate SNMP traps triggered by UPS event changes.</td>
</tr>
<tr>
<td>UPS load segment control</td>
<td>Control UPS load segments (separate receptacle groups). Increase runtime by up to 50% on mission-critical loads. Switch different UPS loads on and off at predefined times or in power failure situations.</td>
</tr>
<tr>
<td>UPS reboot and scheduled shutdown</td>
<td>Command UPSs to reboot specific computer systems or inter-networking devices either locally or remotely over the network. Initiate scheduled shutdown/reboot tasks with integrated UPS applications.</td>
</tr>
<tr>
<td>Network-wide UPS battery test</td>
<td>Test battery health for all UPSs throughout the network.</td>
</tr>
<tr>
<td>Management information base (MIB) support</td>
<td>Powerware LanSafe Software and ConnectUPS X-Slot Card systems support the Internet standard (RFC1628.mib) UPS MIB, as well as a variation of the standard MIB, known as the Powerware MIB (stdups1.mib). In addition, ConnectUPS X-Slot Card systems support the PowerMIB (xups.mib) that provides extra functionality such as load segment control.</td>
</tr>
<tr>
<td>SNMP set and get operations support</td>
<td>Control and manage the UPSs on the network via SNMP.</td>
</tr>
<tr>
<td>SNMP trap forwarding support</td>
<td>Forward SNMP traps from IBM Director to other network management systems.</td>
</tr>
<tr>
<td>Central log for UPS events</td>
<td>Log all or predefined UPS events network-wide in a central IBM Director log.</td>
</tr>
</tbody>
</table>
UPS Monitoring and Management Options

From the IBM Director Console(s) with Powerware Extensions installed, it is possible to view many system configurations. A few examples are listed below:

1. Powerware UPSs communicating serially with PCs running Powerware LanSafe Software (see Figure 1).

To monitor and control systems using Powerware LanSafe Software, install the Powerware LanSafe Software on the IBM Director Console before installing Powerware Extensions. It is also recommended to install Powerware LanSafe Software on the IBM Director Server.

2. A Powerware UPS with a ConnectUPS-X Web/SNMP Card communicating over a network with a PC running a Web browser (see Figure 2).

To view Powerware UPSs with the ConnectUPS-X Web/SNMP Card, Powerware LanSafe Software Remote Services and a Web browser must be installed on the IBM Director Console.

Figure 1. Powerware UPSs Communicating Serially with Computers Running Powerware LanSafe Software

Figure 2. Powerware UPS with ConnectUPS-X Web/SNMP Card
3. A ConnectUPS-X Web/SNMP Card or ConnectUPS-MX SNMP Card in a Powerware UPS supporting peripheral equipment such as a hub, but with no associated PC (see Figure 3).

4. Agent computers with Powerware LanSafe Software or viewing the ConnectUPS X-Slot Card user interface with a Web browser (see Figure 4).

Reference Documentation

For more information about IBM Director, refer to the *IBM Director Installation and Configuration Guide* and the *IBM Director Systems Management Guide*. These documents can be found on the IBM Web site on the IBM Director page.

For more information about Powerware LanSafe Software, press the F1 key from any window for online help.

For more information about the ConnectUPS X-Slot Card user interface, open the Help menus.
Chapter 2  

System Requirements

IBM Director 5.10 or above must be installed in accordance with IBM requirements and procedures. Refer to the IBM Director documentation.

See the following sections for the Powerware Extensions requirements for each system type.

IBM Director Server Computer

The IBM Director Server computer requires the following:

- Microsoft® SNMP Service installed and running.
- Microsoft SNMP Trap Service stopped.
- Microsoft SNMP Trap Service set to Disabled or Manual.
- IBM Director SNMP Access and Trap Forwarding feature installed.
- Computer configured to discover SNMP devices.
- To monitor Powerware LanSafe Power Management Software systems, Powerware LanSafe Software must be installed.

IBM Director Console Computer

The IBM Director Console computer requires the following:

- Microsoft SNMP Service installed and running.
- To monitor Powerware LanSafe Software systems, Powerware LanSafe Software must be installed.

Powerware LanSafe Software Systems

The Powerware LanSafe Software systems require the following:

- Powerware LanSafe Power Management Software v5 installed.
- The Microsoft Windows® operating system must be configured to forward SNMP traps to the IBM Director Server. See page 8 for more information.
Powerware ConnectUPS X-Slot Card Systems

The Powerware ConnectUPS X-Slot Card systems require the following:

- One of the following Powerware ConnectUPS X-Slot Cards installed:
  - a 10 Mb card with firmware v1.39 or above
  - a 10 Mb/100 Mb card with firmware v2.03 or above
- A Web browser installed on the computer that monitors and controls the UPS.
- For shutting down the computer, NetWatch Clients software must be installed (available from [http://www.powerware.com/software/downloads.asp](http://www.powerware.com/software/downloads.asp)).

Configure the ConnectUPS-X Web/SNMP Card for read/write access and trap forwarding as follows:

1. Set “Write Access Managers” to include the IBM Director Server.
2. Set “Trap Receivers” to include the IBM Director Server.

To determine the Web card firmware version, either browse the MIB for `upsIdentUPPSoftwareVersion`, or click Configuration and Web/SNMP Card Configuration from the Powerware ConnectUPS X-Slot Card interface.

Chapter 3

Supported Operating Systems

This chapter lists the operating systems supported by the Powerware Extensions tool for the IBM Director Server and the IBM Director Console.

IBM Director Server

- Microsoft Windows Server 2003 SP1 (Standard, Enterprise, and Web Editions)
- Microsoft Windows Server 2003 SP1 (Standard, Enterprise, and Web x64 Editions)
- Microsoft Windows 2000 Server
- Microsoft Windows 2000 Advanced Server

IBM Director Console

- Microsoft Windows Server 2003 SP1 (Standard, Enterprise, and Web Editions)
- Microsoft Windows Server 2003 SP1 (Standard, Enterprise, and Web x64 Editions)
- Microsoft Windows XP Professional
- Microsoft Windows 2000 Server
- Microsoft Windows 2000 Professional
- Microsoft Windows 2000 Advanced Server
Chapter 4  

Installation

When you install Powerware Extensions on a computer running IBM Director Server or IBM Director Console, you have the following capabilities:

- **Running Powerware LanSafe Power Management Software from the IBM Director Console** – You can open Powerware LanSafe Software from the IBM Director Console to monitor and manage any UPS in the network that is running Powerware LanSafe Software if: 1) you install Powerware LanSafe Software on the IBM Director Server and the IBM Director Console, and 2) you configure Powerware Extensions as described in “Initial Configuration” on page 9.

- **Running the ConnectUPS SNMP/Web Card from the IBM Director Console** – You can open a ConnectUPS SNMP/Web Card from the IBM Director Console to monitor and manage any UPS that is attached to a ConnectUPS SNMP/Web Card on the network if: 1) the IBM Director Console has a Web browser, and 2) you configure Powerware Extensions as described in “Initial Configuration” on page 9.

- **Using the IBM Director Console SNMP Browser to access SNMP-supported information about a UPS** – After installing Powerware Extensions, see “Operations” on page 12.

For detailed examples of configurations, see “UPS Monitoring and Management Options” on page 2.

**NOTE**  
Before you begin, verify that the requirements for the IBM Director Server on page 4 are met.

For IBM Director Servers and Consoles Running Powerware LanSafe Software

**IMPORTANT**  
Powerware Extensions for IBM Director should be installed on the IBM Director Server and then on the IBM Director Console computers.

To install Powerware Extensions:

2. Extract the files to the hard drive.
3. Run Setup.exe.

The setup program is self-guiding.
For IBM Director Servers and Consoles Not Running Powerware LanSafe Software

Install Powerware LanSafe Software before installing Powerware Extensions:

2. Extract the files to the hard drive.
3. Run Setup.exe.
4. If prompted, select Yes to temporarily terminate SNMP services.
5. At the Welcome screen, select Install.
6. Select LanSafe only for the type of installation.
7. Select Continue.
8. Enter Destination Directory and select Continue.
9. Click OK.
10. Install Powerware Extensions as described in the previous section.

Configuring Powerware LanSafe Software to Forward Traps to the IBM Director Server

The Microsoft SNMP Service must be installed and the Microsoft Windows operating system must be configured to forward traps to the IBM Director Server. Use the SNMP Service Properties – Traps tab for the service (see Figure 5).

![Figure 5. SNMP Service Properties – Traps Tab](image)

**NOTE** Adding the IP address of the IBM Director Server should be done by the system administrator.
Chapter 5

Initial Configuration

Follow the procedures in this chapter after installing Powerware Extensions.

This chapter provides procedures for configuring the system so you can:

- Monitor and manage Powerware UPSs from the IBM Director Console using Powerware LanSafe Power Management Software or the ConnectUPS X-Slot Card user interface.
- See a System Information icon on the IBM Director Console whenever a system or device is in an alarm or trap situation.

To access the IBM Director Console:

1. On the Start menu, point to Programs→IBM Director and click Management Console.
2. When prompted, enter the UPS device name or IBM Director Server IP address, a user ID, and password.

The IBM Director Console opens (see Figure 6).

![IBM Director Console](image)

**Figure 6. IBM Director Console**

The following tasks are described in this chapter:

- Discovering SNMP Devices – see page 10.
- Performing Inventory Collection on SNMP Devices – see page 10.
Discovering SNMP Devices

Click **SNMP Devices** in the Groups pane. Discovered SNMP devices appear in the middle pane. To populate or refresh this pane, select **Tasks -> Discover Systems -> SNMP Devices** on the menu bar. Allow sufficient time for the system to search the network.

Performing Inventory Collection on SNMP Devices

To add information regarding each UPS to the IBM Director SQL database:

1. In the Groups pane, right-click **SNMP Devices**.
   
   A context menu opens.

2. Select **Collect Inventory**. See Figure 7.

![Figure 7. SNMP Devices Collect Inventory Selection](image)

The Inventory Service window opens (see Figure 8). As inventory collection takes place, changes are reported in the Inventory Status pane.

![Figure 8. Inventory Service Window](image)
3. Note the sweeping blue bar progress indicator in the lower left corner of the Inventory Service window. When the bar stops sweeping, inventory collection is complete.

4. To close the Inventory Service window, select **File**→**Close** from the menu bar.

**Associating an Event Action Plan for a Status Update**

To create a visual notification when a UPS event or trap occurs:

1. In the IBM Director Console window, expand **Event Action Plans** in the Tasks pane. See Figure 9.

2. Drag **Update Status on UPS Events** from the Tasks pane and drop it on **Powerware UPS Devices** in the Groups pane.

3. You are prompted: Are you sure you want to add this event action plan to the selected group? Click **Yes**.

When a UPS event occurs, a System Information Icon displays next to the device name.

![Figure 9. Completed Task Console (Update Status on Events)](image-url)
Chapter 6

Operations

Follow the procedures in this chapter after configuring the system as described in “Initial Configuration” on page 9.

Tasks you can perform with Powerware Extensions include:

• Monitoring Tasks
  – Checking UPS Battery Conditions – see page 14.
  – Viewing the Load Percent for a UPS – see page 16.
  – Locating Model and Version Information – see page 18.
  – Setting MIB Attribute Values – see page 20.
  – Viewing UPS Inventory Data for Quick System Information – see page 23.
  – Viewing UPS Event Logs – see page 25.

• Management Tasks
  – Testing the UPS Battery – see page 26.
  – Shutting Down and Restarting a UPS Device – see page 26.
  – Setting Read-Write Rights in Microsoft Windows – see page 29.
  – Shutting Down and Restarting Load Segments – see page 30.
  – Configuring Event Notifications – see page 31.
  – Limiting Event Notifications – see page 31.
  – Responding to Event Notifications from the IBM Director Console – see page 32.

• Starting UPS Software – see page 33.
Use the SNMP Browser on the IBM Director Console to obtain information from the UPS. If the UPS does not support the information, the information is not available.

Information details are described in the management information base (MIB) files. Powerware LanSafe Software and ConnectUPS X-Slot Card systems support the Internet standard (RFC1628.mib) UPS MIB, as well as a variation of the standard MIB, known as the Powerware MIB (stdupsv1.mib). In addition, ConnectUPS X-Slot Card systems support the PowerMIB (xups.mib) that provides extra functionality such as load segment control.

To view the MIB information, you can follow the mgmt directory tree (available for all Powerware devices) or the private directory tree (available for ConnectUPS X-Slot Card devices).

Start all tasks from the IBM Director Console (see Figure 10).

---

**Figure 10. IBM Director Console**
Checking UPS Battery Conditions

This task uses the SNMP Browser and the Powerware MIB (stdupsv1.mib) for checking UPS battery conditions. You can adapt the procedure to access other MIB information available through the SNMP Browser.

1. Click Powerware UPS Devices in the Groups pane. The Powerware UPS devices appear in the middle pane. Then do one of the following:

   - In the Tasks pane, drag the SNMP Browser icon and drop it on a UPS device name or IP address.
   - Right-click a UPS device name or IP address, opening a context menu; click SNMP Browser.

The SNMP Browser window for the UPS device opens. See Figure 11.

![Figure 11. SNMP Browser](image-url)
2. In the Device Information pane, expand the mgmt directory tree: iso→org→dod→internet→mgmt→mib-2→upsMIB→upsObjects→upsBattery. See Figure 12.

![Expanded Mgmt Directory Tree](Image)

Figure 12. Expanded Mgmt Directory Tree

3. See battery information by clicking any of the following attributes:
   - upsBatteryStatus
   - upsSecondsOnBattery
   - upsEstimatedMinutesRemaining
   - upsEstimatedChargeRemaining
   - upsBatteryVoltage
   - upsBatteryTemperature

   Information is displayed as shown in Figure 13.
4. Systems with a ConnectUPS X-Slot Card can also expand the private directory tree: iso → org → dod → internet → private → enterprises → powerware → xups → xupsBattery.

See additional battery information in the following attributes:

- xupsBatTimeRemaining
- xupsBatVoltage
- xupsBatCapacity
- xupsBattery/AbmStatus

**Viewing the Load Percent for a UPS**

This task demonstrates how you can access percent load information from the IBM Director Console (see Figure 10 on page 13). Percent load is the percentage of the UPS power capacity presently being used by the load.

1. Click **Powerware UPS Devices** in the Groups pane. The Powerware UPS devices appear in the middle pane. Then do one of the following:

   - In the Tasks pane, drag the SNMP Browser icon and drop it on a UPS device name or IP address.
   - Right-click a UPS device name or IP address, opening a context menu; click **SNMP Browser**.

The SNMP Browser window for the UPS device opens.
2. In the Device Information pane, do one of the following:

- Expand the mgmt directory tree: `iso → org → dod → internet → mgmt → mib-2 → upsMIB → upsObjects → upsOutput → upsOutputTable → upsOutputEntry → upsOutputPercentLoad`.

View percent load information by selecting the `upsOutputPercentLoad.1` attribute. See Figure 14.

- Systems with a ConnectUPS X-Slot Card can also expand the private directory tree: `iso → org → dod → internet → private → enterprises → powerware → xups → xupsOutput`.

View percent load information by selecting the `xupsOutputLoad` attribute. See Figure 15.

---

**Figure 14. upsOutputPercentLoad.1 Attribute**

**Figure 15. xupsOutputLoad Attribute**
Locating Model and Version Information

This task demonstrates how you can access model and version information from the IBM Director Console (see Figure 10 on page 13).

**NOTE** If you need to contact Eaton Powerware Technical Support for assistance, please have the UPS model and software version information available.

1. Click **Powerware UPS Devices** in the Groups pane. The Powerware UPS devices appear in the middle pane. Then do one of the following:
   - In the Tasks pane, drag the SNMP Browser icon and drop it on a UPS device name or IP address.
   - Right-click a UPS device name or IP address, opening a context menu; click **SNMP Browser**.

   The SNMP Browser window for the UPS device opens.

2. In the Device Information pane, expand the mgmt directory tree: `iso -> org -> dod -> internet -> mgmt -> mib-2 -> system` (see Figure 16).

![Figure 16. sysObjectID Attribute](image-url)
3. See system information by clicking any of the following attributes:
   - sysDescr
   - sysObjectID – see Figure 16
   - sysUpTime
   - sysServices
   In addition, you can set the following attributes:
   - sysContact
   - sysName
   - sysLocation
   See the following section, “Setting MIB Attribute Values.”

4. In the Device Information pane, expand the mgmt directory tree:
   - iso
   - org
   - dod
   - internet
   - mgmt
   - mib-2
   - upsMIB
   - upsObjects
   - upsIdent.
   See system information in the following attributes:
   - upsIdentManufacturer
   - upsIdentModel
   - upsIdentUPSSoftwareVersion
   - upsIdentAgentSoftwareVersion

5. Systems with a ConnectUPS X-Slot Card can also expand the private directory tree:
   - iso
   - org
   - dod
   - internet
   - private
   - enterprises
   - powerware
   - xups
   - upsIdent.
   See system information in the following attributes:
   - xupsIdentManufacturer
   - xupsIdentModel
   - xupsIdentSoftwareVersion
Setting MIB Attribute Values

In the expanded mgmt directory tree for a MIB, the Set icon indicates a value that can be assigned by the system administrator. See Figure 17.

1. In the Value area, type a value in the editable field.
2. Click **Set**.

   The value is set throughout IBM Director.

---

**Figure 17. Setting Attribute Values**

![Setting Attribute Values](image-url)
Using Resource Monitors for Quick System Monitoring

Accessing information one attribute at a time, as described in the preceding tasks, can be time-consuming. The following IBM Director Console task uses the Resource Monitors function to check the battery status of any UPS device in the network. Use this procedure to save time when you regularly check any MIB attribute or set of attributes.

1. Click **Powerware UPS Devices** in the Groups pane. The Powerware UPS devices appear in the middle pane. Then do one of the following:
   - In the Tasks pane, drag the Resource Monitors icon and drop it on a UPS device name or IP address.
   - Right-click a UPS device name or IP address, opening a context menu; click **Resource Monitors**.

   The Resource Monitors window for the UPS device opens.

2. In the Available Resources pane, expand the mgmt directory tree:

   `iso.org.dod.internet.mgmt.mib-2→upsMIB→upsObjects→upsBattery`

   The upsBattery attributes supported by the UPS appear in a list. See Figure 18.

![Figure 18. Resource Monitors Window with upsBattery Attributes](image)
3. Drag one or more attribute icons from the Available Resources pane and drop it in the Selected Resources column of the Selected Resources pane. See Figure 19.

![Figure 19](image)

Figure 19. Attributes Moved to Selected Resources

4. Select File→Save as on the menu bar and save the selection with a unique name (such as BatteryCheck).

The name appears as an icon in the IBM Director Console Tasks pane under Resource Monitors. See Figure 20.

![Figure 20](image)

Figure 20. Resource Monitors Icon

You can then drag this icon and drop it on the icon for any Powerware UPS device (device name or IP address), or on the Powerware UPS Devices icon in the Groups pane to obtain this information for the device or devices.
Viewing UPS Inventory Data for Quick System Information

**NOTE** This procedure assumes you have performed an inventory collection on the SNMP UPS devices in the system. See “Performing Inventory Collection on SNMP Devices” on page 10.

IBM Director displays information gathered from system inventories, giving you a quick overview of all the UPS devices in the system. To view UPS inventory information, do one of the following:

- **Run the View Inventory Task** – Select Tasks→View Inventory on the IBM Director Console menu bar to produce a list of inventory components applicable to the network. The Inventory Query Browser: All Systems and Devices window opens. See Figure 21.

  ![Figure 21. Inventory Query Browser: All Systems and Devices](image)

- **Drag the Inventory icon in the Tasks pane and drop it on Powerware UPS Devices in the Groups pane.** – This produces an inventory list for Powerware UPS devices in the network. See Figure 22.

  ![Figure 22. Inventory Query Browser: Powerware UPS Devices](image)
Click Powerware UPS Devices in the Groups pane, then drag the Inventory icon from the Tasks pane and drop it on a UPS device name or IP address. This opens a list of inventory details applying to the device. See Figure 23.

Figure 23. Inventory Query Browser: Single Device

Note that all query browsers include a list of Available Queries. You can alter the Query Results by selecting different available queries.
Viewing UPS Event Logs

**NOTE** This procedure assumes you have configured the system as described in "Initial Configuration" on page 9.

View the UPS Event Log for the system or devices within the system to study a history of power events to look for trends. You can open a UPS Event Log for all systems or for one system.

Do one of the following:

- **View an Event Log for All Devices** – In the Tasks pane, expand the listing for Event Log and double-click **UPS Events**.
- **View an Event Log for One Device** – Click Powerware UPS Devices in the Groups pane, then drag the Event Log icon in the Tasks pane and drop it on a UPS device name or IP address.

The Event Log (UPS Events) window opens. See Figure 24.

![Figure 24. Event Log for a UPS](image-url)
Testing the UPS Battery

NOTE  For systems supporting Powerware LanSafe Software (but not the ConnectUPS X-Slot Card) – Access the Powerware LanSafe Software using the Powerware UPS Launcher task (see page 33) and test the battery within the Powerware LanSafe Software.

Testing the UPS battery involves placing the system on battery power for several seconds for evaluation. UPSs either pass or fail the test.

The following procedure is for ConnectUPS X-Slot Card systems:

1. Set the ConnectUPS X-Slot Card with a community name for read/write access. See the ConnectUPS X-Slot Card manual.

2. Click Powerware UPS Devices in the Groups pane. The Powerware UPS devices appear in the middle pane. Then do one of the following:
   - In the Tasks pane, drag the SNMP Browser icon and drop it on a UPS device name or IP address.
   - Right-click the UPS device name or IP address, opening a context menu; click SNMP Browser.

   The SNMP Browser window for the UPS device opens.


4. Set the xupsStartBattery attribute to start the test.

5. Review the results in the xupsTestBatteryStatus attribute.

Shutting Down and Restarting a UPS device

NOTE  Before configuring the software for shutdowns and restarts, note the following:

- **Powerware LanSafe Software Systems** – In the Microsoft Windows operating system, configure the SNMP Service with a community name with read-write rights. See “Setting Read-Write Rights in Microsoft Windows” on page 29.

- **ConnectUPS X-Slot Card Systems** – Set the ConnectUPS X-Slot Card with a community name for read/write access. See the ConnectUPS X-Slot Card manual.

To shut down and restart a UPS device through the SNMP Browser on the IBM Director Console:

- Set the same **Community Name** for the UPS device in the software that you set in Powerware LanSafe Software or the ConnectUPS X-Slot Card. The Community Name must be for read/write access. Do not use the ‘public’ Community Name, which is read-only.

- **Set the upsShutdown attributes for the shutdown and restart you want.**
Setting the Community Name

To set the Community Name:

1. Click Powerware UPS Devices in the Groups pane. The Powerware UPS devices appear in the middle pane. Then do one of the following:
   - In the Tasks pane, drag the SNMP Browser icon and drop it on a UPS device name or IP address.
   - Right-click the UPS device name or IP address, opening a context menu; click SNMP Browser.

   The SNMP Browser window for the UPS device opens.

2. Right-click the UPS device name or IP address in the Device Information pane, opening a context menu; click Change Community Name.

3. Enter a new name in the Change Community Name dialog box.
Setting the upsShutdown Attributes

To set the upsShutdown attributes in the SNMP Browser:

1. Expand the mgmt directory tree for the UPS device: iso→org→dod→internet→mgmt→mib-2→upsMIB→upsObjects→upsControl

Set the desired attributes:

- **upsShutdownType** – Determines the action to occur when the countdown of the upsShutdownAfterDelay and upsRebootWithDuration objects reaches zero. Set at **output(1)** to limit the shutdown to the UPS output receptacles. Set at **system(2)** to cause the entire UPS system to turn off.

- **upsShutdownAfterDelay** – Shuts down (turns off) either the UPS output receptacles or the entire UPS system (as determined by the value of upsShutdownType at the time of shutdown) after the indicated number of seconds, or sooner if the UPS batteries are depleted. Set to **0** for an immediate shutdown. Set to **-1** to abort the countdown. If the system is in the desired state when the countdown reaches 0, nothing happens. That is, there is no additional action if upsShutdownType = system and the system is already off. Similarly, there is no additional action at that time if upsShutdownType = output and the output is already off. When read, upsShutdownAfterDelay returns the number of seconds remaining until shutdown, or -1 if no shutdown countdown is in effect. On some systems, if the agent is restarted during a shutdown countdown, the countdown may be aborted. Sets to this object override any upsShutdownAfterDelay already in effect.

- **upsStartupAfterDelay** – Starts the output after the indicated number of seconds. This includes starting the UPS, if necessary. Set to **0** for an immediate startup. Set to **-1** to abort the countdown. If the output is already on when the countdown reaches 0, nothing happens. Settings override the effect of any upsStartupAfterDelay countdown or upsRebootWithDuration countdown in progress. When read, upsStartupAfterDelay returns the number of seconds remaining until startup, or -1 if no startup countdown is in effect. If the countdown expires during a utility failure, the startup does not occur until the utility power is restored. On some systems, if the agent is restarted during a startup countdown, the countdown is aborted.

- **upsRebootWithDuration** – Shuts down (turns off) either the UPS output receptacles or the entire UPS system (as determined by the value of upsShutdownType at the time of shutdown) for the indicated number of seconds. After this period, the output restarts. If the time to perform the request exceeds the requested duration, the requested shutdown and startup cycles are performed in minimum time, but in no case does this require more than the requested duration plus 60 seconds. When read, upsRebootWithDuration returns the number of seconds remaining until shutdown, or -1 if no countdown is in effect. If the startup occurs during a utility failure, the startup does not begin until the utility power is restored.

- **upsAutoRestart** – When set to **on**, causes the UPS system to restart after a shutdown if the shutdown occurs during a power loss caused by either a upsShutdownAfterDelay or an internal battery depleted condition. When set to **off**, prevents the UPS system from restarting after a shutdown until an operator manually or remotely restarts it. If the UPS is in a startup or reboot countdown, the UPS does not restart until that delay is satisfied.
Setting Read-Write Rights in Microsoft Windows

The Microsoft SNMP Agent must be configured for read-write rights. Use the SNMP Properties – Security tab for the service (see Figure 25).

![Figure 25. SNMP Properties – Security Tab](image)

**NOTE** Configuring the community name and rights should be done by the system administrator.
Shutting Down and Restarting Load Segments

ConnectUPS X-Slot Card systems can shut down and restart individual UPS load segments. Note that the terms Receptacle, Outlet, and Load Group are used interchangeably and all mean “one of a set of controllable, power-switched outputs.”

1. Expand the private directory tree: \iso\org\dod\internet\private\enterprises\powerware\xups\xupsRecep\xupsRecepTable.

See system information in the following attributes:

- \xupsRecep – The number of independently controllable receptacles, as described in the \xupsRecepTable.

- \xupsRecepTable

2. Expand \xupsRecepTable and set the available attributes as necessary:

- \xupsRecepIndex – The number of the receptacle or load segment.

- \xupsRecepStatus – Enter a value of 1=On/Close, 2=Off/Open, 3=On w/Pending Off, 4=Off w/Pending On, or 5=Unknown.

- \xupsRecepOffDelaySecs – The delay in seconds until the load segment or receptacle is turned off. Set to any value other than -1 (0 is immediately). Setting it to -1 causes an attempt to abort a pending shutdown. When this object is set while the UPS is on battery, it is not necessary to set \xupsRecepOnDelaySecs, because the outlet turns back on when power is available.

- \xupsRecepOnDelaySecs – The delay in seconds until the load segment or receptacle is turned on. Set to any value other than -1 (0 is immediately). Setting it to -1 causes an attempt to abort a pending restart.

- \xupsRecepAutoOffDelay – The delay in seconds after going on battery until the receptacle is automatically turned off. A value of -1 means that this output should never be turned off automatically, but must be turned off only by command. Values from 0 to 30 are valid, but probably inappropriate. The AutoOffDelay can be used to prioritize loads in the event of a prolonged power outage; less critical loads will turn off earlier to extend battery time for the more critical loads. If the utility power is restored before the AutoOff delay counts down to 0 on an outlet, that outlet will not turn off.

- \xupsRecepAutoOnDelay – The delay in seconds after the outlet is signaled to turn on until the output is automatically turned on. A value of -1 means that this output should never be turned on automatically, but only when specifically commanded. A value of 0 means that the receptacle should turn on immediately at power-up or for an ON command. Use \xupsRecepAutoOnDelay for the following reasons:

  - To coordinate the automatic startup of various outlets when the normal auto-sequencing of 1 second per outlet is not adequate. For example, the outlets may be used to power up hard disk arrays before CPU units are started.

  - To force additional Down Time during \xupsRecepOffDelaySecs commands, for equipment to be reset, when the standard Down Time is not long enough.

  - For the -1 value, to ensure that loads won’t be powered until commanded, following power-up or an \xupsRecepOffDelaySecs command.
Configuring Event Notifications

Use the Event Action Plan Builder task for such purposes as sending an Internet (SNMP) e-mail, sending an SNMP trap to an IP host or NetView host, sending a numeric page, or starting a program on a system or on the server.

Limiting Event Notifications

Use event filters to tailor the flow of event notifications, ensuring that unwanted messages are not sent.

To limit event notifications:

1. Select **Tasks ➔ Event Action Plan Builder** on the IBM Director Console menu bar.
   The Event Action Plan Builder window opens.
2. In the Event Filters pane, right-click **Simple Event Filters** and click **New**.
3. Clear the **Any** check box and expand the directory trees for **UPS ➔ Powerware** and **UPS ➔ RFC1628**.
   The list of UPS events appears as shown in Figure 26.

![Figure 26. Simple Event Filters List](image)
4. Select the events you want to be notified about.

To select consecutive events, press Shift + the first event and Shift + the last event. To select a random set of events, press Ctrl + any event for each event desired.

5. Click File→Save As in the menu bar to name and save the list.

The list is created. An icon for the event filter appears in the Tasks pane of the IBM Director Console.

6. Associate the Event Action Plan with the UPS devices (see page 11).

**Responding to Event Notifications from the IBM Director Console**

On the IBM Director Console, view the All Systems and Devices group. If the System Information icon appears beside the icon for a UPS device name or IP address, it indicates an event or trap. See Figure 27.

![System Information Icon](image)

**Figure 27. Device with System Information Icon**

Right-click the System Information icon. A context menu opens. See Figure 28.

![System Information Icon Context Menu](image)

**Figure 28. System Information Icon Context Menu**

Use the context menu for the following functions:

<table>
<thead>
<tr>
<th>Function</th>
<th>Context Menu Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run Powerware LanSafe Software or view a ConnectUPS Card</td>
<td>Select <strong>Powerware UPS Launcher</strong>. The Powerware LanSafe Software PowerScope or ConnectUPS Card screen opens, depending on the system.</td>
</tr>
<tr>
<td>See an Event log</td>
<td>Select <strong>Event Log</strong>. An IBM Director Event Log opens.</td>
</tr>
<tr>
<td>Clear the System Information icon</td>
<td>Select <strong>System Status → System Information</strong>.</td>
</tr>
</tbody>
</table>
Starting UPS Software

The available UPS software for a device depends on the UPS device communication configuration. For Powerware UPSs with serial communication with a computer, the following procedure starts the Powerware LanSafe Software. For Powerware UPSs with ConnectUPS X-Slot Cards communicating with the network, the procedure opens the ConnectUPS X-Slot Card interface.

Do one of the following:

- On the IBM Director Console, drag the **Powerware UPS Launcher** task icon from the Tasks pane and drop it on the UPS device name or IP address of a system running Powerware LanSafe Software or the ConnectUPS X-Slot Card.
- Right-click the device icon to open a context menu, then click **Powerware UPS Launcher**.

Systems running Powerware LanSafe Software open with PowerScope as shown in Figure 29.

![Figure 29. Powerware LanSafe Power Management Software v.5 PowerScope](image-url)
The following table lists some of the main Powerware LanSafe Software features and benefits:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prioritized and sequential shutdown*</td>
<td>Ensures that all network transactions are completed prior to shutdown. Workstations are shut down first, inter-networking equipment is shut down next, and servers are shut down last.</td>
</tr>
<tr>
<td>True orderly shutdown: work-in-progress is saved throughout the network</td>
<td>All unsaved information in applications is saved throughout the network. All applications are closed in an orderly manner. The operating systems are shut down gracefully. The UPSs are turned off. The UPSs wait for the power to return before starting up (user defined).</td>
</tr>
<tr>
<td>Local and remote reboot/shutdown</td>
<td>The UPS can be commanded to reboot a specific computer system either locally or remotely over the network (an orderly shutdown is performed during this event).</td>
</tr>
<tr>
<td>Network-wide testing</td>
<td>Network-wide testing</td>
</tr>
<tr>
<td>SNMP trap sending</td>
<td>Ability to send SNMP traps to network management systems (NMSs).</td>
</tr>
</tbody>
</table>

* Eaton patented software technology
Systems with the ConnectUPS X-Slot Card open with the ConnectUPS X-Slot Card interface as shown in Figure 30.

Figure 30. ConnectUPS X-Slot Card Interface

ConnectUPS X-Slot Card benefits include the following:

- Provides Web access for easy monitoring and management, any time, any place, with any standard Web browser
- Works with a wide range of third-party network management software programs (SNMP)
- Performs remote monitoring and control of UPS-protected devices network-wide
- Uses e-mail notification to provide real-time UPS event information
- Provides automatic shutdown with NetWatch software
Chapter 7

Eaton Powerware Technical Support

If you have any questions or problems with the software, technical assistance is available through the Eaton Powerware Web site (www.powerware.com).

Please have your UPS model and software version information available (see “Locating Model and Version Information” on page 18).