User's Guide

PowerAlert® Network Shutdown Agent Software

Note: *PowerAlert is not required to operate your UPS system. For the latest PowerAlert updates, go to www.tripplite.com/software.*

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1. Introduction

PowerAlert Network Shutdown Agent (PANSA) monitors one or two network-attached Tripp Lite UPS systems for specific power events, takes the appropriate action to preserve backup power, and protects sensitive equipment from damage. Example actions include shutting down the computer receiving UPS backup power when the UPS enters a low battery condition or, in a VMware application, signaling an ESXi Host to shut down. If the ESXi Host is a member of a high availability cluster, the desired response to the low battery event could be to shut down the virtual machines running on the host before shutting down the host itself. This User's Guide will cover the basic scenarios.

Feature	Comments
Unattended computer operating system shutdown	Must monitor WEBCARDLX, SNMPWEBCARD or PowerAlert Local for shutdown signal
Autodiscovery of SNMP-enabled devices	Discovers devices accessible on the network via WEBCARDLX, SNMPWEBCARD and PowerAlert Local (software version 12.04.0040 and above)

Figure 1.1: PowerAlert Network Shutdown Agent Key Features

This document is divided into three sections, each covering implementation with a different operating system / environment. Please refer to the section that applies to your environment:

- **Section 2.** Windows Implementation
- **Section 3.** Linux Implementation
- **Section 4.** VMware Implementation

2. Windows Implementation

2.1 Pre-Installation

Note: *PANSA requires pre-installation configuration of firewall software settings and/or WEBCARDLX/SNMPWEBCARD settings.*

- Open UDP ports 161, 162, 3664 and 3665 on your computer's firewall software and disable the Windows SNMP trap service.
- The host computer for the device PANSA will be monitoring must also have UDP ports 161, 162, 3664 and 3665 open on its firewall software.
- If PANSA will be configured to monitor a WEBCARDLX or SNMPWEBCARD, enable the card's SNMP access and define a read/write community string (the default community string for firmware version 12.04.0048 and above is **tripplite**).

Warning: Do not install more than one edition of a PowerAlert product on a single computer.

If you have a previous version of PANSA installed, Tripp Lite recommends you manually uninstall it prior to installing the new version.

2.2 Installation

Go to **www.tripplite.com/software/** to download the latest PANSA installer package for Windows.

Once downloaded, double-click the PowerAlert installer and follow the on-screen prompts. The installer will attempt to uninstall previous versions of PANSA (if this action was not performed during pre-installation).

Current Windows platforms are supported.

2.3 Configuration

After installation, the option to launch the PANSA Console (Figure 2.3.1) becomes available. The Console contains all the controls required to operate PANSA.

The "Monitored UPS" fields will be blank when PANSA starts up for the first time. Click the "Discover Agents" button to open the discovery settings window (Figure 2.3.2). Enter an IP address and community name (**tripplite** is the default). You must click the "Add to list" button after each entry and can add multiple entries, if desired. Use the asterisk character (*) as a wildcard in the IP address field. For example, 192.168.1.* will cover 192.168.1.1 through 192.168.1.255. If you know the specific IP address of the device you plan to monitor, enter that address. If you are unsure what information to enter in the discovery settings window, contact your network administrator for assistance.

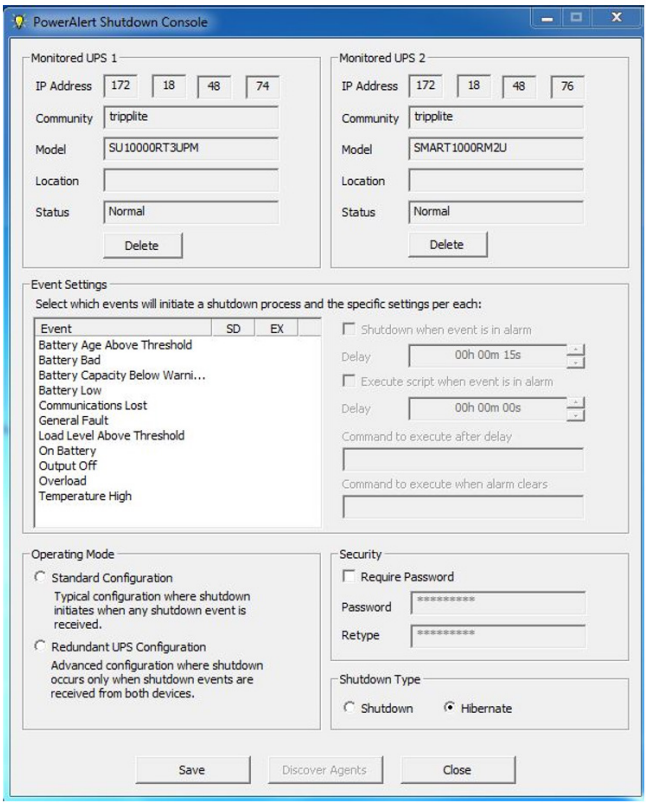


Figure 2.3.1

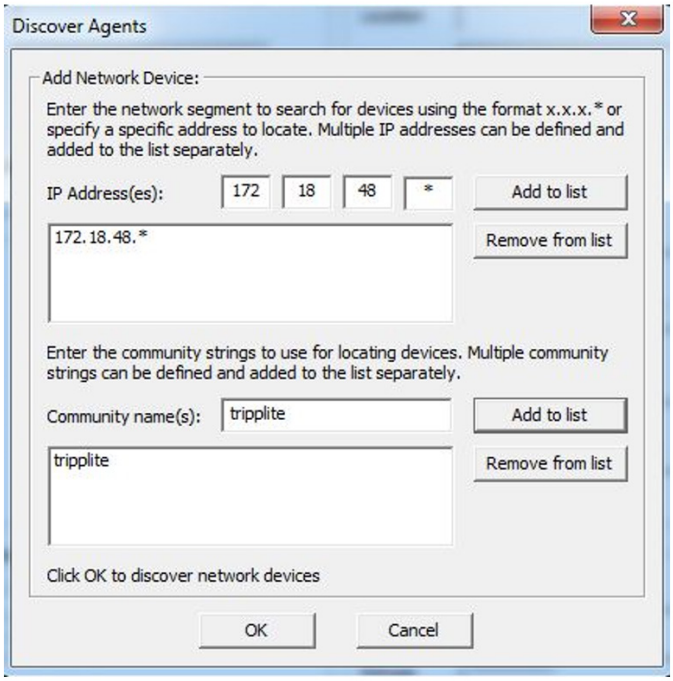


Figure 2.3.2

Note: *PANSA attempts to discover compatible WEBCARDLX and SNMPWEBCARD firmware, PowerAlert Local and previous versions of PowerAlert software, but it does not search for PowerAlert Network Management System or other PowerAlert Network Shutdown Agents on the network.*

2. Windows Implementation

After entering the IP addresses and community names to search, click “OK” to initiate the network autodiscovery process. Autodiscovery will detect SNMP-enabled Tripp Lite devices on the local network that PANSA is able to monitor. The results window (Figure 2.3.3) will list compatible devices detected by the autodiscovery process. If no devices are detected, confirm the devices have been configured with the firewall and other settings listed earlier.

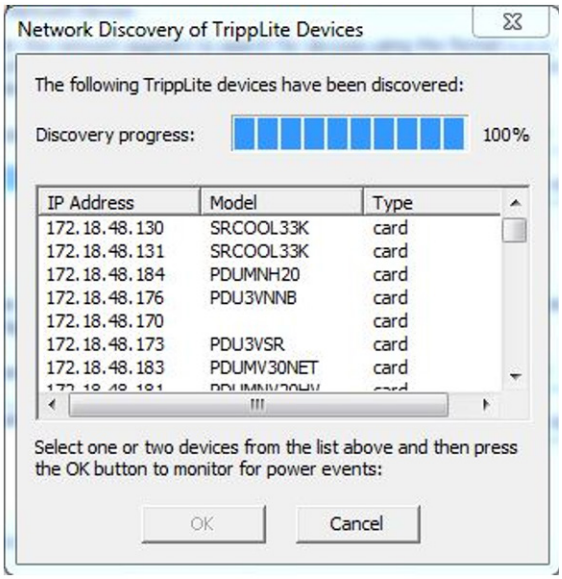


Figure 2.3.3

Select either one or two systems to be monitored by PANSA, then click “OK” to return to the main console window. The device or devices selected will be displayed in the “Monitored UPS” fields. Each device’s IP address, community name, model, location and status will be shown.

The Status field shows whether the monitored device is currently accessible. If the monitored device is offline, PANSA will attempt to reconnect to the monitored device continuously for 15 minutes, then once every 15 minutes. You can add devices by running the autodiscovery process again. Devices can also be deleted from the console, resulting in PANSA de-registering itself from the device.

2.3.1 Event Settings

After selecting one or two systems to monitor, you should define which monitored event(s) will prompt PANSA to either shut down your computer or execute a command. The list of events is dynamic, and includes items such as “Battery Low,” “On Battery” and “Temperature High,” as well as events that may be specific to the monitored device; supported events vary from device to device. For a complete list of events supported by a specific device, launch the PowerAlert Console for that device and examine the Events module.

Highlight one or more events in the list, then choose to enable shutdown and/or command execution when the selected event(s) is (are) detected. Events that are not selected will be ignored. Use the delay dials to set the amount of time PANSA will wait for the event to clear before shutting down the computer or executing a command.

2.3.2 Shutdown

When PANSA is triggered to act, it will perform either a shutdown or hibernation based upon the selected *Shutdown Type*. “Hibernate” will be an available choice only if the hibernation feature is supported by your computer’s operating system. If it is supported, “Hibernate” will be the default setting.

2.3.3 Command Execution

PANSA manages and monitors the selected system(s) and can execute a command upon receiving a critical event, such as a power outage. It can also execute a command when the event clears, such as returning to utility power. The command can be used to launch an executable or to execute a batch file. Typically, the command execution is used to spawn a batch file that instructs other external systems to shut down, such as VMware servers. Refer to **Section 4** for more information on executing commands and scripts for VMware.

Warning! Any user with access to PANSA can change which script will be executed.

Note: *For Windows to run an executable file that interacts with the desktop, ensure the Interactive Services Detection is set to Automatic Start and is initiated.*

2.3.4 Operating Mode

The “Operating Mode” setting applies only when PANSA is monitoring two UPS systems; it defines the conditions under which your computer will shut down and/or execute commands. If “Standard Configuration” is selected, your computer will shut down when either monitored device experiences a trigger event. If “Redundant UPS Configuration” is selected, your computer will shut down only when both monitored devices experience a trigger event.

Note: *In a redundant UPS system configuration, each UPS system must have sufficient load capacity to handle the total power requirement of all connected equipment.*

2.3.5 Security

The PANSA Console must authenticate with the PANSA service. By default, the password to perform this authentication is **tripplite**; PANSA uses this password by default to perform the requisite authentication. The “Security” setting determines whether a password other than **tripplite** is required by the PANSA Console to access the PANSA service.

2.4 System Tray Icon

The PANSA status icon is located in the Windows system tray and provides a convenient visual notification of power status. During normal conditions, a light bulb icon will display, as shown in Figure 2.4.1. If you place the mouse pointer over the icon, a tooltip will display text to explain the icon’s meaning. Right-clicking on the icon will show a popup menu listing available options.

Figure 2.4.1

The status icon and tooltip text will change to indicate corresponding changes in power and UPS system status. The possible icon representations are as follows:

Note: *Icon graphics may differ based on the operating system of the PANSA host computer.*

- The light bulb icon is displayed when all devices are on utility power and running under normal conditions.
- The yellow warning icon is displayed when one or more warning-level events—monitored or not—are triggered. Example: a UPS running on battery power.
- The red “X” icon is displayed when one or more critical-level events—monitored or not—are triggered. Example: a UPS running on battery with a low-battery condition.
- The black “X” icon is displayed when the PANSA Console cannot communicate with the target device. This indicates that either the UPS is offline or a network error is restricting communications.
- The lock icon is displayed when security is enabled and the password is changed from the default password **tripplite**. When locked, the PANSA Console user must enter the correct password, which enables the Console to communicate with the PANSA service.

3. Linux Implementation

3.1 Pre-Installation

Note: *PANSA requires pre-installation configuration of firewall software settings and/or WEBCARDLX/SNMPWEBCARD settings.*

- Open UDP ports 161, 162, 3664 and 3665 on your computer's firewall software.
- The host computer for the device PANSA will be monitoring must also have UDP ports 161, 162, 3664 and 3665 open on its firewall software.
- If PANSA will be configured to monitor a WEBCARDLX or SNMPWEBCARD, enable the card's SNMP access and define a read/write community string (the default community string for firmware version 12.04.0048 and above is **tripplite**).

Warning: Do not install more than one edition of a PowerAlert product on a single computer.

If a previous version of PANSA has been installed, Tripp Lite recommends you manually uninstall it prior to installing the new version.

3.2 Installation

1. Go to **http://www.tripplite.com/software/** to download the latest PANSA installer package for the specific Linux operating system.
2. Copy the appropriate software file to your local machine.
3. Open a terminal used for your local machine.
4. Change to the directory where the file is located and enter the following command: **sudo rpm -i <rpm-file-name> [--nodeps]**. Use the RPM main page for assistance with any installation issues.

PANSA will install to the directory **/var/tripplite/poweralert** and will place or install the daemon process for each software version within **/var/tripplite/poweralert/engine**.

3.3 Configuration

After installation, PANSA can be configured either by modifying its configuration file or by launching the PANSA Java Console. This section contains the details for each configuration method.

3.3.1 Configuring PANSA Using the Java Console (requires Java 1.6)

1. The Java console will be located in the **/var/tripplite/poweralert/console** directory.
2. In a terminal, change to the **/var/tripplite/poweralert/console** directory.
3. To launch the console, enter the following command: **./pansa_console.sh** .

The PANSA Java Console operates identically to the PANSA Console for Windows. Refer to **Section 2.3** for additional details.

3.3.2 Configuring PANSA Using the Configuration File

The PANSA installation package includes a sample configuration file, which can be used to configure the system without a graphical interface (GUI). All settings available in the GUI Console are available in the configuration file. Read **Section 2.3** prior to modifying a configuration file.

Below is content from the sample configuration file included in the installation package:

```
[PA_Remote]
Server=10.15.0.8
SNMPMacAddress=00:06:67:23:66:6d
SNMPVersion=2
SNMPCommunity=tripplite
SNMPPort=161
SNMPTrapPort=162

[PA_Remote_2]
Server=10.15.0.9
SNMPMacAddress=00:06:67:23:66:6e
SNMPVersion=2
SNMPCommunity=tripplite
SNMPPort=161
SNMPTrapPort=162

[RemoteEvent:On Battery]
EnableShutdown=true
ShutdownDelay=15
EnableExecuteCommand=false
ExecuteCommandDelay=5
ExecuteCommandOnSet=/home/vi-admin/shutdownesxi.sh
ExecuteCommandOnClear=

[PA_Engine]
ShutdownRequired=All
```

3. Linux Implementation

The configuration file must be modified and configured for use in your environment as follows:

1. Change the directory to the root installation directory: **cd /var/tripplite/poweralert** .
2. Copy the sample configuration file: **sudo cp example_paconfig.ini paconfig.ini** .
3. Edit the configuration file: **sudo vi paconfig.ini** .
4. The [PA_Remote] section identifies the attributes of the primary remote system being monitored.
   a. The Server keyword is the remote system's IP address. Change this value to the IPv4 address of the remote system.
   b. SNMPMacAddress is the MAC address of the remote system identified in 4a, above. This keyword is optional and can be omitted if not known. If omitted, the entire line must be removed from the configuration file.
   c. SNMPVersion specifies the SNMP version in use by the remote system. This value should correspond with the credentials configured on the WEBCARDLX, SNMPWEBCARD or PowerAlert Local system. The valid values are: 1 for SNMPv1, 2 for SNMPv2. SNMPv3 is currently not supported by PANSA.
   d. SNMPCommunity is the community string used to authenticate with the remote system. The default value is **tripplite** and may only be changed if the same read/write community has been defined on the remote system. Remote PowerAlert Local systems require a community string of **tripplite**.
   e. SNMPPort is the port the remote system listens for SNMP-get and SNMP-set requests. By default, WEBCARDLXs and SNMPWEBCARDs are configured for port 161 and PowerAlert Local systems are configured for port 3664. The value should correspond with the remote system.
   f. SNMPTrapPort is the port the remote system sends SNMP traps to PANSA. By default, WEBCARDLXs and SNMPWEBCARDs are configured for port 162 and PowerAlert Local systems are configured for port 3665. The value should correspond with the remote system.
5. The [PA_Remote_2] section identifies the attributes of the secondary remote system being monitored.
   a. **If monitoring one UPS system:**
      i. Remove the entire [PA_Remote_2] section from the configuration file.
      ii. In the [PA_Engine] section, remove ShutdownRequired, as it is not needed for a single UPS configuration.
      iii. Skip to Step 6 below.
   b. **If monitoring two UPS systems:**
      i. Using the same instructions in Step 4, make the necessary modifications as they apply to the secondary system.
      ii. If the two systems are configured for redundancy, then in the [PA_Engine] section, keep the ShutdownRequired=All value. This will cause the shutdown and/or command execution to occur when both UPS systems are in an alarm condition. If the two UPS systems are configured independently, change the value to ShutdownRequired=One. This will cause the shutdown and/or command execution to occur when either UPS system is in an alarm condition.
6. Each [RemoteEvent:<EventName>] section in the configuration file describes the options for each event supported by the selected remote system(s). The file contents described at the beginning of this section are for an "On Battery" event. This is the event that triggers when a power outage occurs and the UPS goes on battery. If you require maximum runtime, you can change the section name to [RemoteEvent:Low Battery]. If you would like one delay or command to execute when on battery, but different settings for low battery, you can make a copy of the section so both events are listed in the configuration file.
   a. The EnableShutdown keyword defines whether or not the event is selected. If the value is "true", then the event is selected and PANSA will monitor the event. If "false", the event will not be used to trigger a system shutdown.
   b. ShutdownDelay specifies the number of seconds PANSA will wait for the event to clear before shutting down the computer when and if EnableShutdown is set to "true".
   c. The EnableExecuteCommand keyword defines whether or not the event is selected. If the value is "true", then the event is selected and PANSA will monitor the event. If "false", the event will not be used to trigger a command execution.
   d. ExecuteCommandDelay specifies the number of seconds PANSA will wait for the event to clear before executing the command specified for ExecuteCommandOnSet, when and if EnableExecuteCommand is set to "true". This value does not apply to ExecuteCommandOnClear, which is executed immediately when and if EnableExecuteCommand is set to "true" and the event clears.
   e. The value specified for ExecuteCommandOnSet is the command that will execute when the delay expires after the event is triggered. This value is optional. If not specified, no command will execute when the event is triggered.
   f. The value specified for ExecuteCommandOnClear is the command that will execute immediately when the event clears. The value is optional. If not specified, no command will execute when the event clears.

   Note: *If neither EnableShutdown nor EnableExecuteCommand is set to "true", the event will be omitted and will not be monitored.*

7. The [PA_Engine] section specifies system options for PANSA itself.
   a. ShutdownRequired specifies whether shutdown and/or command execution will occur when an event is triggered on one or both UPS systems. If set to “All”, an event must occur on both UPS systems before shutting down or executing a command. If set to “One”, an event must occur on only one UPS. Refer to **Section 2.3** for related information.
8. Save the changes to the configuration file: **:qCR** (CR=carriage return).

After the configuration file is changed, you must stop PANSA, delete all data files and restart it. Do this by entering the following commands:

```
sudo service pasdad stop
cd /var/tripplite/poweralert/data
sudo rm –rf *
sudo service pasdad start
```

It is also important to ensure PANSA is configured to run at startup. Enter the following command to enable running PANSA at startup:

```
sudo chkconfig pasdad on
```

4. VMware Implementation (ESXi Server Environments)

PANSA is compatible with VMware* ESXi 5.x and ESXi 6.x servers and can be installed on a virtual machine to provide the management of the UPS and trigger an ESXi shutdown upon detecting an event, such as a power outage. There are three implementation choices:

4.1 **RECOMMENDED:** PANSA for VMware vSphere Management Assistant (vMA)

4.2 Alternate A: PANSA for standard Operating Systems

4.3 Alternate B: PowerAlert Local (for Windows Operating Systems only)

The Recommended and Alternate A solutions require a Tripp Lite WEBCARDLX and SNMPWEBCARD installed on the UPS powering the ESXi Server.

** Free versions of VMware ESXi Server are incompatible with PANSA for VMware due to a known issue in the free version of VMware, wherein PANSA shutdown scripts are not permitted to write to the server and initiate shutdown. Purchasing a licensed version of ESXi Server will resolve this issue.*

4.1 PANSA for VMware vSphere Management Assistant (vMA)

The recommended implementation of PANSA for VMware is to install VMware's vSphere Management Assistant (vMA) on a virtual machine on the ESXi server and then install PANSA onto the vMA. This is depicted in figure 4.1.1 below.

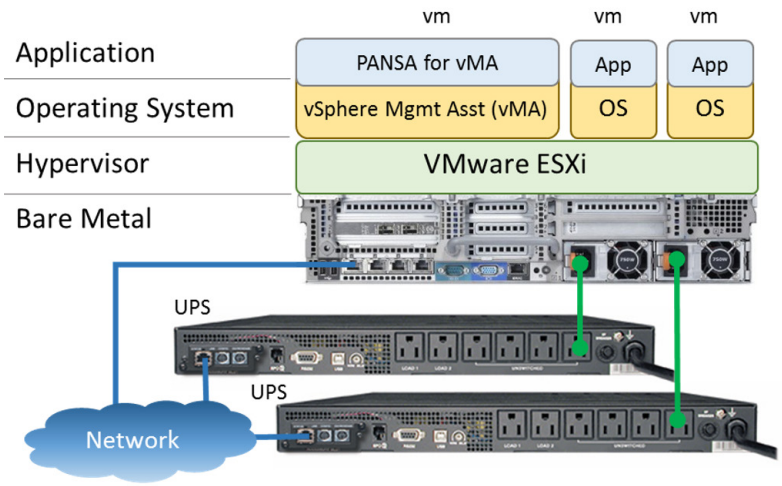


Figure 4.1.1

4.1.1 Installation

Step 1. Install VMware vSphere Management Assistant (vMA)

Visit **http://www.vmware.com/support/developer/vima/** for more information on downloading and installing the vMA on ESXi host machines.

Step 2. Install VMware Tools

VMware Tools must be installed on each virtual machine for graceful shutdowns whenever the host receives a power outage notification.

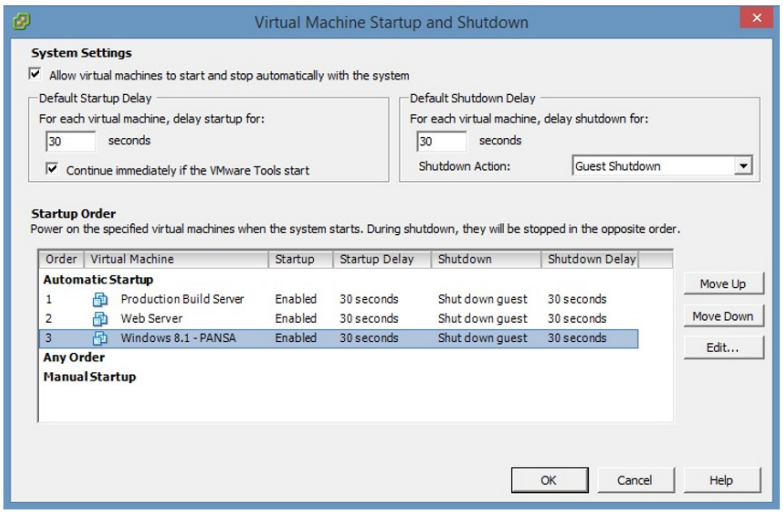
1. Open a vSphere Client and connect to an ESXi host server.
2. Click the "Virtual Machines" tab.
3. For each virtual machine:
   a. Right-click on the VM, select Power → Power On.
   b. Right-click on the VM, select Open Console.
   c. Right-click on the VM, select Guest → Install VMware Tools.
   d. Complete the VMware Tools installation via the virtual machine's console.

4. VMware Implementation (ESXi Server Environments)

Step 3. Configure ESXi Shutdown

The ESXi host must be configured to allow automatic startup and shutdown of virtual machines (guest operating systems). The following steps provide information on configuring the ESXi host to gracefully shutdown the virtual machines:

1. Click the "Configuration" tab.
2. Select "Virtual Machine Startup/Shutdown".
3. Click "Properties", located in the panel's top right-hand corner.
4. Select the checkbox to allow virtual machines to start and stop automatically with the system.
5. Enter the appropriate default startup delay and default shutdown delay desired.
6. Choose "Guest Shutdown for Shutdown Action".
7. For each virtual machine that is to be shut down during a power outage:
   a. Select and highlight the VM.
   b. Click the "Move Up" button until the VM is listed in the Automatic Startup section.
8. Use the "Move Up" and "Move Down" buttons to order all VMs accordingly.
9. The following screen depicts a correctly configured Virtual Machine Startup and Shutdown dialog:



Step 4. Configure Firewall, WEBCARDLX and/or SNMPWEBCARD

Note: *PANSA requires pre-installation configuration of firewall software settings, WEBCARDLX and/or SNMPWEBCARD settings.*

- Open UDP ports 161, 162, 3664 and 3665 on your virtual machine's firewall software.
- The host computer for the device PANSA will be monitoring must also have UDP ports 161, 162, 3664 and 3665 open on its firewall software.
- If PANSA will be configured to monitor WEBCARDLX or SNMPWEBCARD, enable the card's SNMP access and define a read/write community string (the default community string for firmware version 12.04.0048 and above is **tripplite**).

Warning: Do not install more than one edition of a PowerAlert product on a single VM.

If a previous version of PANSA has been installed, Tripp Lite recommends you manually uninstall it prior to installing the new version.

Step 5. Install PANSA for vMA

The PowerAlert Network Shutdown Agent for vMA download contains all files required for installation and configuration onto the OpenSUSE-based vMA virtual machine.

1. Go to **http://www.tripplite.com/software/** to download the latest version of PANSA for vMA.
2. Upload the RPM package to the vMA VM using an SCP client.
3. Open a terminal on the vMA.
4. Change to the directory where the file is located and enter the following command: **sudo rpm -ivh <rpm-file-name> --nodeps**. Use the RPM man page to help you through any installation issues.

Note: *Four VMware "script missing" warnings will appear after the installation completes. Please disregard these warnings.*

PANSA will install to the directory **/var/tripplite/poweralert** and will place or install the daemon process for each software version within **/var/tripplite/poweralert/engine** .

4. VMware Implementation (ESXi Server Environments)

4.1.2 Configuration

VMware's vMA virtual machine only offers a command line interface. Therefore, it is necessary to configure PANSA using its "paconfig.ini" textual configuration file. The instructions and details for modifying the configuration file are the same as described for the PANSA for Linux installation. Refer to **Section 3.3.2** for instructions on editing the configuration file.

PANSA is typically configured for shutting down an operating system; however, this may not be the case when running the configuration as a virtual machine. With virtual machine configurations, users often will opt to shut down the host ESXi server instead of the VM. Executing a script is usually required to perform this action. As such, the following [RemoteEvent:On Battery] section should be used for a virtual machine configuration instead of the instructions detailed in **Section 3.3.2**:

```
[RemoteEvent:On Battery]
EnableShutdown=false
ShutdownDelay=15
EnableExecuteCommand=true
ExecuteCommandDelay=5
ExecuteCommandOnSet=/home/vi-admin/shutdownesxi.sh
ExecuteCommandOnClear=
```

The difference in the configuration instructions in this section from the instructions in **Section 3.3.2** is the EnableShutdown value is set to "false" and the EnableExecuteCommand is set to "true". Doing this will cause PANSA to execute the specified OnSet script when the On Battery event is triggered, but not shut down the operating system. The shutdown configuration of the ESXi server described in **Step 3** will shut down the virtual machine on which PANSA is running. When performing this action, it is also important to configure the ESXi server to shut down this virtual machine last.

4.1.3 Modifying and Configuring Scripts

PANSA manages and monitors a device—typically a UPS—and then optionally executes a command or script that instructs the computer to perform some process upon receiving a critical event, such as a power outage. The PANSA installation provides sample command-line scripts that trigger the ESXi shutdown. However, these scripts must be modified and configured for use in your environment as follows:

1. Using an SCP Client, upload the **shutdownesxi.sh** script file to the vMA's **/home/vi-admin** directory.
2. In the vMA terminal, change to the home directory to **cd /home/vi-admin** .
3. Change the script attributes by using the command **sudo chmod 755 shutdownesxi.sh** .
4. Edit the configuration file to **sudo vi shutdownesxi.sh** .
5. Change the parameters in the desired script to connect with the target ESXi host:
   a. --server parameter specifies the address of the ESXi host
   b. --username parameter specifies the user name used to log into the host
   c. --password parameter specifies the password used to log into the host
6. This script can be extended as desired to shut down multiple hosts.
7. Save the changes to the script as **:qCR** (CR=carriage return).

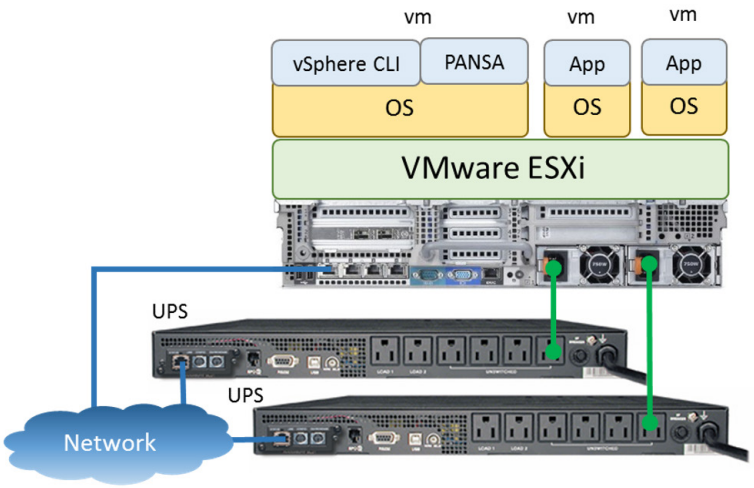
Note: *It is suggested you test your modified script before use within PANSA to ensure successful performance.*

Note: *Each script can be extended to perform whatever actions are desired. Sample scripts, which include shutting down multiple hosts and shutting down hosts in high availability (HA) clusters, can be found in Appendix A.*

4. VMware Implementation (ESXi Server Environments)

4.2 Alternate A: PANSA for Non-vMA Operating Systems

Although the recommended implementation is to install PANSA on a virtual machine installed with VMware's vMA, PANSA can be installed on any supported virtual machine and provide the same functionality. This section outlines the steps required to install PANSA on a non-vMA virtual machine.



Step 1. Install VMware Tools on the target virtual machine (refer to Step 2 in **Section 4.1.1** for details).

Step 2. Configure shutdown settings on the host ESXi server (refer to Step 3 in **Section 4.1.1** for details).

Step 3. Install VMware's vSphere CLI.

VMware's vSphere CLI provides the same scripting functionality as is built into the vMA. Visit VMware's web site to download and install the vSphere CLI onto the target virtual machine.

Step 4. Install the version of PANSA respective to the target VM's operating system.

The PANSA download contains all files required for installation and configuration onto the VM. If the VM is using Windows, refer to **Section 2**. for installation and configuration instructions. If the VM is using Linux, refer to **Section 3**. for installation and configuration instructions.

4.3 Alternate B: PowerAlert Local

This solution should only be used when a WEBCARDLX or SNMPWEBCARD is not available. PowerAlert Local (PAL) communicates directly with a UPS via an RS-232 serial or USB connection to determine when a critical shutdown event such as a power outage occurs. It can shut down the computer and execute a script, which instructs an ESXi host to shut down just like PANSA.

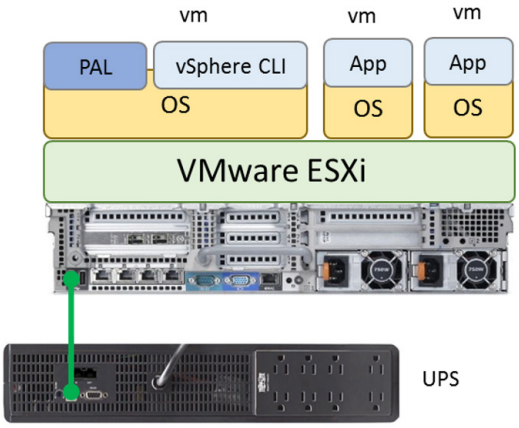


Figure 4.3.1

Instructions on installing and configuring PowerAlert Local is beyond the scope of this manual. For more information, refer to the manuals included in the PowerAlert Local's installation package or on Tripp Lite's web site.

The same PANSA scripts work for PowerAlert Local, regardless if used for Windows or Linux. However, the same modifications to configure them for your environment must still be performed. Refer to **Section 4.1.3** for more information on modifying and configuring scripts.

5. Troubleshooting

Problem	Possible Solutions
PowerAlert Network Shutdown Agent is not able to discover the desired device.	Open UDP ports 161, 162, 3664 and 3665 on your computer's firewall software and disable the Windows SNMP trap service. The device's host computer that PowerAlert Network Shutdown Agent will be monitoring must also have UDP ports 161, 162, 3664 and 3665 open on its firewall software. If PowerAlert Network Shutdown Agent will be configured to monitor a WEBCARDLX or SNMPWEBCARD, enable the card's SNMP access and define a read/write community string (**tripplite** is the default for firmware version 12.04.0048 and above). The computer that PowerAlert Network Shutdown Agent is installed on should have a static IP address. If the address is dynamic, PowerAlert Network Shutdown Agent must be reconfigured each time it changes. Make sure all computers and devices are on the same network subnet and confirm that the TCP/IP network connections and local device communications are optional. The monitored PowerAlert software or SNMPWEBCARD firmware must be version 12.04.0055 or above.
PowerAlert Network Shutdown Agent detects the device, but the device status does not change when a customer configured event occurs.	Open UDP ports 161, 162, 3664 and 3665 on your PANSA computer's firewall software and disable the Windows SNMP trap service.

6. Technical Support

Before contacting Tripp Lite Technical Support, refer to **Section 5**. for possible solutions. If you are still unable to resolve the problem, contact Tripp Lite Technical Support at:

E-mail: techsupport@tripplite.com

Web: The latest PowerAlert software updates are available at **www.tripplite.com/software/**

Technical Support Assistance: www.tripplite.com/support

APPENDIX A – Sample Scripts

PANSA manages and monitors a device—typically a UPS—and then optionally executes a command or script that instructs the computer to perform some process upon receiving a critical event, such as a power outage. The PANSA installation provides several sample command-line scripts for both Windows and Linux operating systems. This appendix describes these sample scripts. Refer to **Section 4.1.3** for more information on installing, modifying and configuring scripts. Also refer to comments inside the file for further instructions on configuring the scripts for your environment.

Note: *Each sample script shown in this appendix requires that user names and passwords be entered in their appropriate command line spaces. Normal alphanumeric characters can generally be written as is; however, some special characters such as !, #, % and $ need to be prefixed with a backslash ("\"). For example, the password "h@ppy" must be typed as "h\@ppy" in the command line for the script to function correctly.*

1. Shutdown ESXi Server(s)

This script is used to shut down one or more ESXi servers, relying upon the pre-configured shutdown settings on each server to gracefully shut down the virtual machines running on each. This is the recommended script to use when installing PANSA for VMware in its recommended configuration (installing PANSA on a vMA).

Linux Script: shutdownesxi.sh

```
#!/bin/bash
# Change directory to directory containing vicfg script files.
cd /usr/bin

# Resolves "server version unavailable" error caused by perl
# module wanting to check a certificate, which many not be
# available.
export PERL_LWP_SSL_VERIFY_HOSTNAME=0

# Trigger the host to shut down based upon its preconfigured
# settings. Be sure to change the server, username and password
# parameters before use.
./vicfg-hostops --server 10.0.0.25 --username xxxx --password xxxx --operation shutdown --force

# Duplicate the above line as needed to shut down additional
# ESXi servers.
#./vicfg-hostops --server 10.0.0.26 --username xxxx --password xxxx --operation shutdown --force
#./vicfg-hostops --server 10.0.0.27 --username xxxx --password xxxx --operation shutdown --force
#./vicfg-hostops --server 10.0.0.28 --username xxxx --password xxxx --operation shutdown --force
```

Windows Script: shutdownesxi.bat

```
# Change directory to directory containing vicfg script files.
cd "c:\program files\vmware\vmware vsphere cli\bin"

# Trigger the host to shut down based upon its preconfigured
# settings. Be sure to change the server, username and password
# parameters before use.
vicfg-hostops.pl --server 10.0.0.25 --username xxxxx --password xxxxx --operation shutdown --force

# Duplicate the above line as needed to shut down additional
# ESXi servers.
#vicfg-hostops.pl --server 10.0.0.26 --username xxxxx --password xxxxx --operation shutdown --force
#vicfg-hostops.pl --server 10.0.0.27 --username xxxxx --password xxxxx --operation shutdown --force
#vicfg-hostops.pl --server 10.0.0.28 --username xxxxx --password xxxxx --operation shutdown --force
```

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2. Shutdown VMs on ESXi Server(s)

This script is used to forcibly shut down the virtual machines on one or more ESXi servers, and then shut down the ESXi server(s). This method does not rely upon the pre-configured shutdown settings on each server to shut down the virtual machines. This script is typically used when performing a shutdown for virtual machines in a high availability (HA) cluster.

Linux Script: shutdownvms.sh

```
#!/bin/sh
LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/vmware/vma/lib64:/opt/vmware/vma/lib
export LD_LIBRARY_PATH
export PERL_LWP_SSL_VERIFY_HOSTNAME=0
SAVEIFS=$IFS
IFS=$(echo -en "\n\b")
# Designate the ESXi host(s) to shut down
hosts=(10.0.0.25 10.0.0.26 10.0.0.27 10.0.0.28)
ups_vm="vSphere Management Assistant \(vMA\)"
# Change directory to directory containing vicfg script files
cd /usr/bin
for host in ${hosts[@]}; do
echo $host
source /opt/vmware/vma/bin/vifptarget -s $host
# Be sure to change the username and password parameters before use
for i in `vmware-cmd -l --username xxxxx --password xxxxx`; do
if [ `vmware-cmd $i getstate | egrep -c “on”` -eq 1 ]; then
echo $i
if [ `echo $i | egrep -c $ups_vm` -eq 1 ]; then
echo "Skip shut down of VMA"
else
echo "Shutting down $i"
vmware-cmd "$i" stop soft
fi
fi
done
source /opt/vmware/vma/bin/vifptarget -c
# Trigger the host server to shut down. Be sure to change the username
# and password parameters before use.
./vicfg-hostops --server $host --username xxxxx --password xxxxx --operation shutdown --force
done
```

Windows Script: shutdownvms.pl

```
#!/usr/bin/perl -w
#
#Shut down the VMs << Uses vmware-cmd.pl
#Place the hosts in Maintenance mode <<Uses vicfg-hostops.pl
#Shut down the hosts <<Uses vicfg-hostops.pl
#Shut down vCenter (if vCenter is a vm you will need to connect to each host separately and shut it down.)
#<< This script connects to each host separately

#use strict;
use warnings;
use 5.14.4;

use VMware::VIRuntime;
use VMware::VILib;
use VMware::VIExt;

my $host;
my $state;
my $toolsstate;
my @vmxcmd;
my $vmxcmd;
my @vmxlist;
my $vmxlist;
my $statecmd;
my $stop;

#my $vmwareBIN = "C:\Program Files (x86)\VMware\VMware vSphere CLI\bin";

my $vmwareCMD = "vmware-cmd.pl";
my $vicfgHostops = "vicfg-hostops.pl";
# Be sure to change the username and password parameters before use
```

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```
my $loginCMD = "-U xxxxx -P xxxxx";
my $loginHostops = "--username xxxxx --password xxxxx";
# Designate the ESXi host(s) to shut down
my @hosts = ("10.0.0.25","10.0.0.26","10.0.0.27","10.0.0.28");

foreach my $host (@hosts) {
#say $host;
@vmxlist=();
$vmxlist="";

$vmxcmd = "$vmwareCMD -H $host $loginCMD -l";
#say $vmxcmd;

$vmxlist = `$vmxcmd`.$vmxlist;
#say $vmxlist;

$vmxlist =~ s/^\n//;
#say $vmxlist;

@vmxlist = split /\n/, $vmxlist;

foreach $vmxlist (@vmxlist) {

#getState (on, off, suspended)
$statecmd = "$vmwareCMD -H $host $loginCMD \"$vmxlist\" getstate";
#say $statecmd;

$state = `$statecmd`;
#say $state;

if($state =~ /(on)$/) {
#getToolsState
$toolsstate = `"$vmwareCMD" -H $host $loginCMD \"$vmxlist\" gettoolslastactive`;
#say $toolsstate;

if($toolsstate =~ /(1)$/) {
#shutdown vm gracefully
$stop = `"$vmwareCMD" -H $host $loginCMD \"$vmxlist\" stop soft`;
}
else {
#stop vm
`"$vmwareCMD" -H $host $loginCMD \"$vmxlist\" stop hard`;
}
}
}
}

#insert wait period to complete vm shutdown
sleep 120;

#Place the host(s) in Maintenance mode
foreach my $host (@hosts) {
say $host;
$vmxcmd = `vicfg-hostops.pl --server $host $loginHostops -operation enter`;
#say $vmxcmd;
}

#insert wait period to complete maintenance mode
#sleep 30;
#Shutdown the host(s)
foreach my $host (@hosts) {
say $host;
$vmxcmd = `vicfg-hostops.pl --server $host $loginHostops -operation shutdown`;
#say $vmxcmd;
}
exit
```