A graceful Hyper-V system shutdown can be accomplished when using a Tripp Lite UPS by selecting one of the following three shutdown options:

**Option 1** – Utilizing the built-in power management feature of the Windows 2008 operating system. The requirements for this solution are a Tripp Lite SMARTPRO® or SMARTONLINE™ UPS with a USB port, and a USB cable connected between the UPS and the server.

**Option 2** – Utilizing Tripp Lite’s PowerAlert Local power management software. The requirements for this solution are a Tripp Lite SMARTPRO or SMARTONLINE UPS with a USB port, and a USB cable connected between the UPS and the server.

**Option 3** – Utilizing Tripp Lite’s PowerAlert Network Shutdown Agent. The requirements for this solution are a Tripp Lite SMARTPRO or SMARTONLINE UPS, and Tripp Lite’s network accessory SNMPWEBCARD.
Option 1 Setup – Built-in Power Management

When the physical computer is shut down, all virtual machines are automatically put into a saved state. The virtual machines that were running when the server shut down will startup automatically when the physical computer starts back up.

Depending upon your environment there are configuration changes suggested, as follows:

1. **Change the automatic stop action.**

   By default, Hyper-V saves the state of all running virtual machines when the physical computer shuts down; however, depending on how much memory is assigned to the VM and the software installed inside the VM, configuring the VM to shutdown rather than hibernate may be the better option.
2. **Change the automatic start action.**

Only virtual machines that were running when the system was shut down are started automatically; however, each VM can be configured to automatically start. Additionally, it is possible to configure each VM’s start up delay to stagger the startup of all VMs, allowing the most important ones to start up first.
3. **Set enough time for the system to shut down.**

It can take a while for Hyper-V to completely shut down as it must hibernate or shut down many virtual machines. For this reason you must ensure that your system starts shutting down with enough battery life left in the UPS to successfully complete the shutdown process. Depending upon how long the shutdown process actually takes for your VMs to shut down, and the amount of battery runtime the UPS selected has, you should configure the critical battery level to a higher percentage than the default value, which is set in the Control Panel’s Power Options. Therefore when the critical battery level you defined is reached, a shutdown process will be initiated with enough time to gracefully shutdown.
Option 2 Setup – PowerAlert Local

Option 2 is similar to Option 1, but instead of using the built-in power management solution, Tripp Lite’s power management solution is installed instead to take advantage of additional UPS management tools and notification options for enhanced power monitoring.

Install the PowerAlert Local power management software available on the CD included with the UPS, or downloaded it from Tripp Lite’s website at http://www.tripplite.com.

Once installed, from the Start menu select All Programs-Triplite-PowerAlert-PowerAlert Console to launch the PowerAlert Console, and then select Settings-Events to configure which events should trigger the shutdown of the system. It is recommended that either the “On Battery” and “Battery Capacity Below Warning Level” event combination, or the “Low Battery” event is selected. The Battery Capacity Below Warning Level is a user configurable threshold that is set to coincide with the Low Battery Warning setting on the Settings-Device panel. To configure the shutdown action it is required that you double-click on the event(s), and then enable the OS and UPS shutdown check boxes and set the shutdown delays in addition to enabling the Shutdown action itself.
Option 3 Setup – PowerAlert Network Shutdown Agent

PowerAlert Network Shutdown Agent does not communicate directly with the UPS. Instead, it communicates through the network to remotely connect to an SNMPWEBCARD installed in the UPS powering the Hyper-V Server, or to a PowerAlert Local running on a computer external from the Hyper-V Server. The Shutdown Agent continually monitors the SNMPWEBCARD or PowerAlert Local to determine when a critical shutdown event, such as a power outage, occurs.

First, install the PowerAlert Network Shutdown Agent for Windows from the CD included with the UPS, or download it from Tripp Lite’s website at http://www.tripplite.com.

Once the software is installed, launch the PowerAlert Network Shutdown Agent console to bring up the configuration GUI.

The following screen depicts a sample Shutdown Agent (Windows) console.

An additional configuration option available when utilizing the PowerAlert Network Shutdown Agent is installing the shutdown software on all or some of the virtual machine’s running within Hyper-V, and modifying the shutdown times of each to achieve a staggered shutdown of the VMs. This option is useful if you have some less critical VMs that can be shutdown sooner or if some VMs take a significantly longer time to shut down. This ensures a graceful shutdown of everything before the battery power or the UPS is exhausted.