System Protect Software

User Manual

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1 Introduction

The SPS (System Protect Software) is one utility which communicates with NMC (Network Monitoring Card). SPS provides logs events, notify users of events and protect system to shutdown gracefully. With the SPS, it can save application's data and documents before system shut down as well.

SPS has two major components: "SPS Service" and "SPS Interface", SPS Service runs in the background as a system service; and SPS Interface is a user interface application that allows the user to tailor the configuration parameters.

1.1 Supported platforms

Supported platforms（validated）:

Windows
Windows XP Home Edition
Windows XP Professional
Windows 2000
Windows Server 2003 x32,x64
Windows Server 2008 x32,x64
Windows Server 2012 x64
Windows Vista x32, x64
Windows 7 x32, x64
Windows 8 x32, x64
Windows 10 x64
Hyper-V Server 2008/2012
LINUX
Red Hat Enterprise Server 5.x for i386,AMD64
Red Hat Enterprise Server 6.x for i386,AMD64
Red Hat Enterprise Server 7.x AMD64
SUSE Enterprise Server 10.x for i386,AMD64
SUSE Enterprise Server 11.x for i386,AMD64
SUSE Enterprise Server 12.x for AMD64（CUI）
Ubuntu 8.x for i386,AMD64
Ubuntu 9.x for i386,AMD64
Ubuntu 10.x for i386,AMD64
Ubuntu 11.x for i386,AMD64
Ubuntu 12.x for i386,AMD64
Ubuntu 13.x for i386,AMD64

Ubuntu 14.x for i386,AMD64
MAC OS
Mac OS 10.5 for PPC
MAC OS 10.6/10.7/10.8/10.9/10.10/10.11 for Intel
VMware Server
VMware ESXi 4.0/4.1/5.0/5.1/5.5/6.0(Paid Version)
VMware ESX 4.0/4.1
Citrix XenServer
Citrix XenServer 6.2
Citrix XenServer 6.5
Unix
Solaris 10/11 for Intel
Solaris 10 for Sparc
FreeBSD 7.X, 8.X, 9.X
HP UX 11.31

1.2 Quickly setup for SPS on Windows

- Download and unzip the SPS installation package, Double click the "setup" program, install the SPS
- The SPS service will be started automatically when the system boots
- Double click the SPS icon in the taskbar, open the SPS interface, Input the NMC IP address to add the device
- Select the alarm events from Events list. The alarm events are selected as default:
  Ac Fail, Battery Low, Schedule Shutdown, Battery Capacity below Limit, Battery Backup Time below Limit
- To check the setting, simulate the system shutdown by SPS according to section 8.5

1.3 Quickly setup for SPS on Linux (Mac OS) with GUI

- Download and unzip the SPS installation package, Enter the command to install the SPS：**./SPS.install**
- Go to the installation path "/opt/sps"， Enter the command to start the SPS manually：**./SPSService**
  The SPS service will be started automatically when the system boots
- Enter the command to open the SPS interface in the Linux：**./SPS**
  Input the NMC IP address to add the device
- Enter the command to open the SPS interface in the MacOS：**open SPS.app**
  Input the NMC IP address to add the device
- Select the alarm events from Events list. The alarm events are selected as default:
  Ac Fail, Battery Low, Schedule Shutdown, Battery Capacity below Limit, Battery Backup Time below Limit

- To check the setting, simulate the system shutdown by SPS according to section 8.5

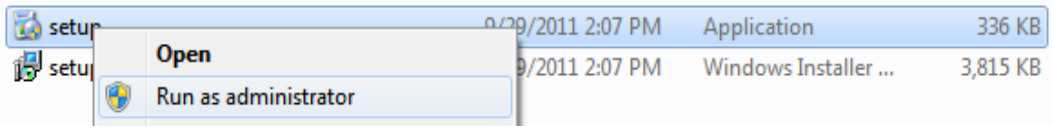
1.4 Quickly setup for SPS on Linux (Unix) with CUI

- Download and unzip the SPS installation package, Enter the command to install the SPS：**./SPS.install**
- Go to the installation path "/opt/sps", Enter the command to start the SPS service：**./SPSService**
  The SPS service will be restarted automatically when the system boots
- Enter the command: **./SPS -i**，input the password，the default password is "admin", edit the configuration, find the below line， Input the NMC IP address to add the device:
  <Remote name="NMC IP" serv="2993" model=""/>
- The alarm events are selected as default:
  Ac Fail, Battery Low, Schedule Shutdown, Battery Capacity below Limit, Battery Backup Time below Limit
- Restart the SPS Service by the command: **./SPS –r**
- To check the setting, simulate the system shutdown by SPS according to section 8.5

2 Installation and configuration for SPS in the Windows

2.1 Installing the SPS

- For Windows XP and server 2003 operating system, open the Windows folder, the installing process can be executed by double click the program icon ("setup.exe" or "setup.msi") directly.
- For Microsoft Windows Vista, server 2008, server 2012, Windows 7 and 8 operating systems, it recommends the installing process is executed with the administrator account, please right click the "setup.exe" and choose "Run as Administrator".



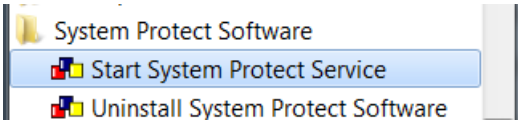
Note: The setup.msi is not available for Windows Vista operating system, server 2008, server 2012, Windows 7 and Windows 8 OS.

- For Windows 2000 operating system, open the Windows-2000 folder, the installing process can be executed by double click the program icon "setup.exe".
- Follow the instruction step by step to finish the installing process.
  - By default of 32 bit operating system, SPS installs to "C:\Program Files\System Protect Software".
  - By default of 64 bit operating system, SPS installs to "C:\Program Files (x86)\System Protect Software"

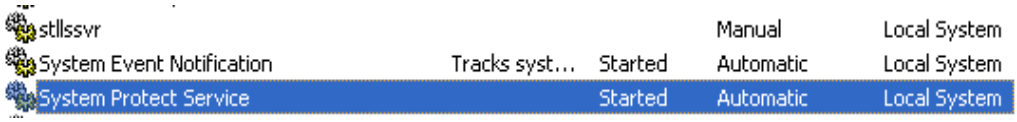
2.2 Starting the SPS

SPS service starts automatically when operating system boots as default.

- There are two methods to start the SPS manually:
  - Select Start menu > "All Programs" > "System Protect Software "to start the Tray Icon and SPS service.



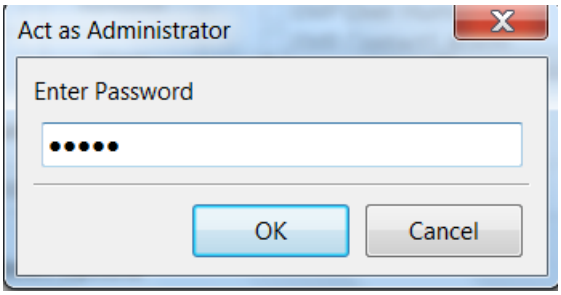
  - Select Start menu > Control Panel > Administrative tools > Services, and find the service "System Protect Service". Right click it and select "Start" to start the SPS service.



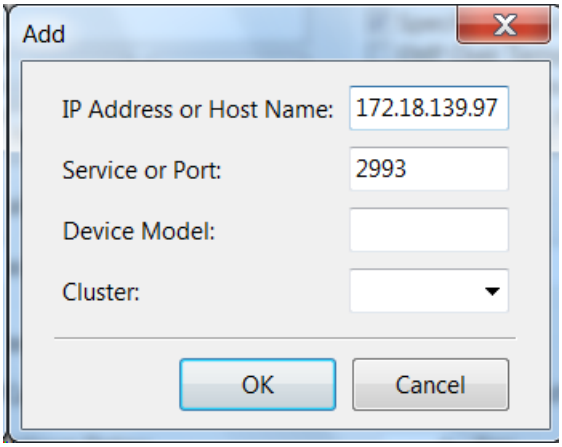
- SPS Icon appears in status area of the task bar after the SPS service start。Double click the Icon will start up the SPS interface screen.

2.3 Configuring the SPS

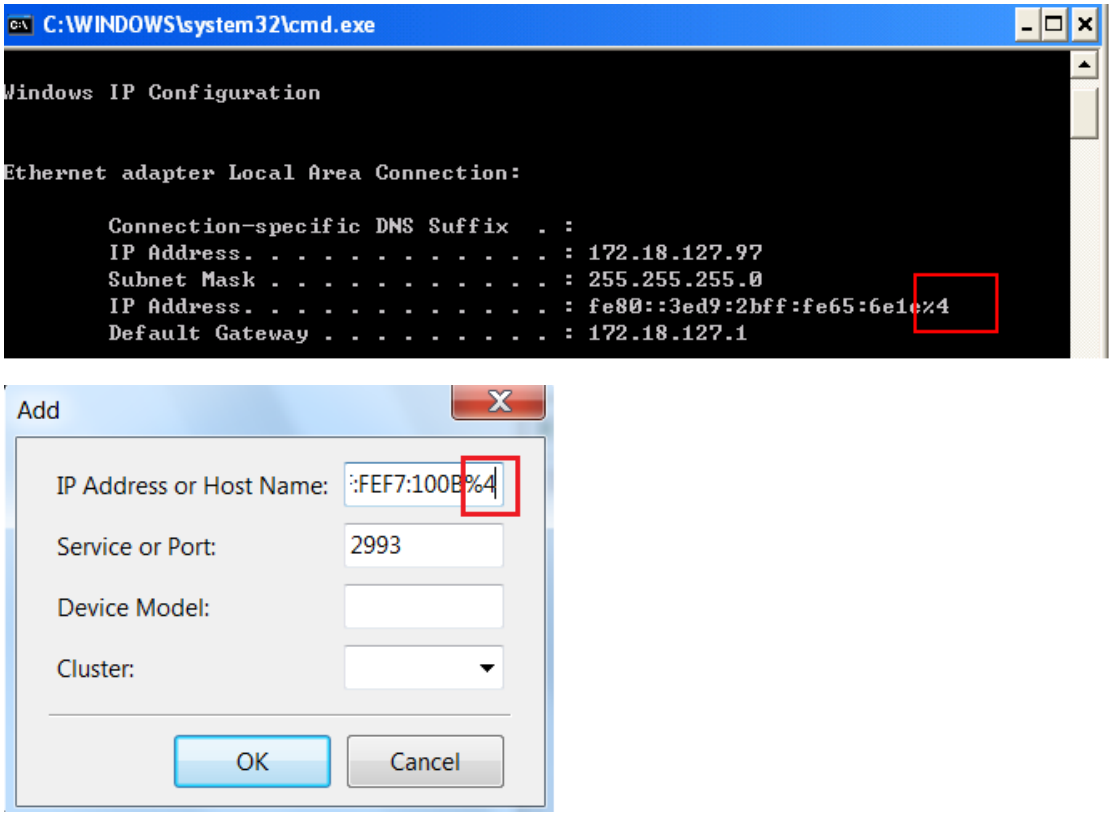
- SPS offers authority system. Only the administrator of SPS has full privilege to configure SPS. General Users have privilege for reading SPS only. The administrator of SPS is able to login by click “System” > “Act as Administrator” and then enter the password. By default, the password is “admin”.



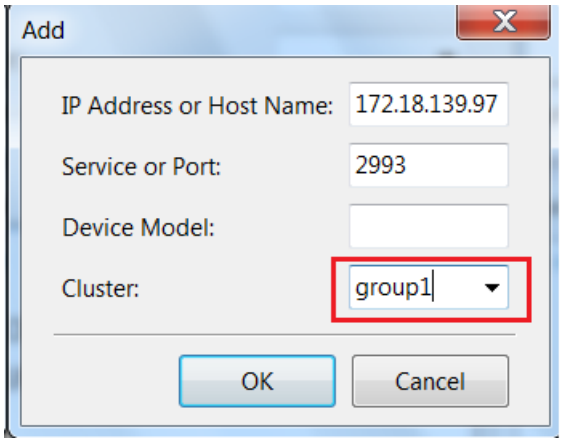
- Enter the IP address of NMC via click “Add” button on SPS interface.

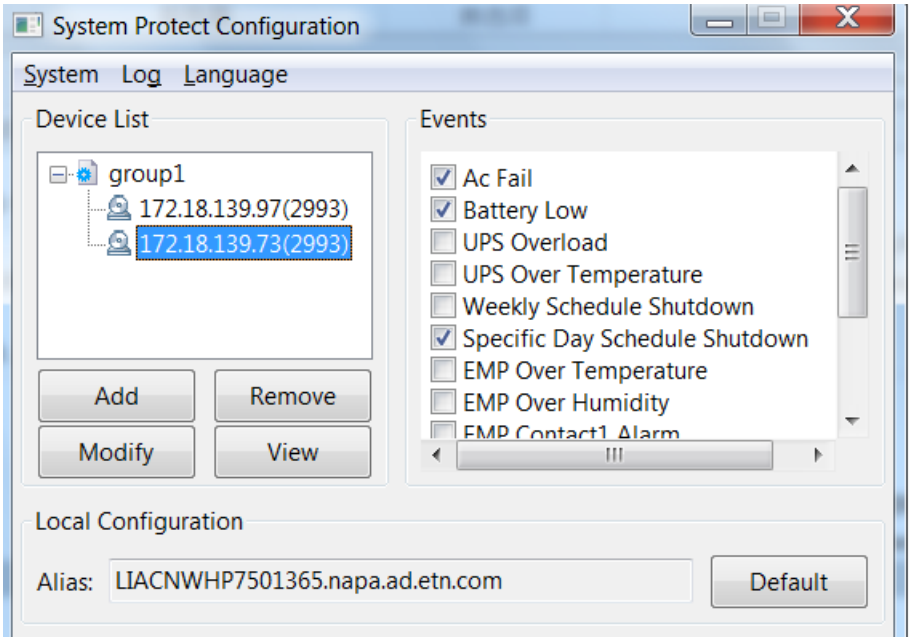


Note: If the IP address is IPV6, Please add the network id as suffix at the end of IP address (for example: %4) as the below image.

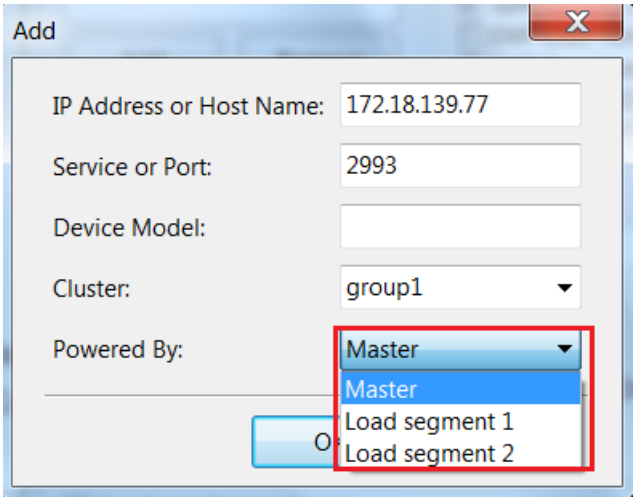


- Enter the Cluster name if the computer is protected by the redundant UPS Input.
  The NMC UPSs that under the same Cluster will become a group.
  For more information, please refer to section 8.4

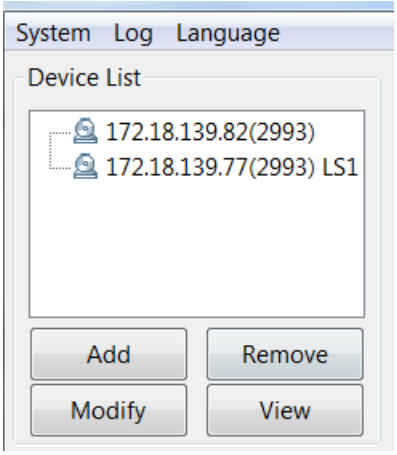




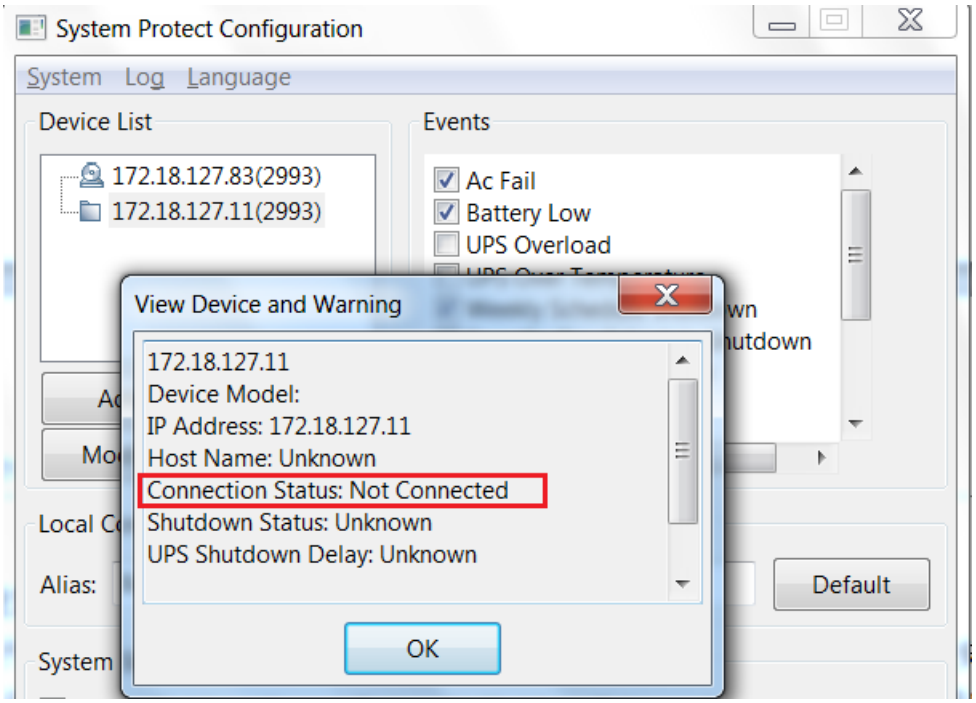
- SPS supply three way for Power: Master, Load segment 1, Load segment 2
  Note: The SPS version should be 1.5.0.2 and later



If the UPS support Load segment, you can choose LS1 or LS2. The device use LS1 as default.
If the UPS don't support Load segment, you can use Master.
For example: 172.18.139.82 use master power and 172.18.139.77 use LS1 power.



- The device icon in the "Device List" will be abnormal if enter the error IP address.
  Click the View button, the Connection Status shows "Not Connected"

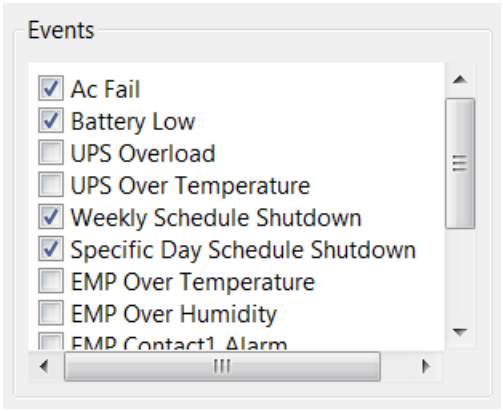


Note： The connection will fail if the UPS output is off.

Synchronously, the Tray Icon in the task widows will be signed with warning.

Move the mouse to the Tray Icon, The detailed information will be prompted.

- Select the alarms checkbox in the Event list: When the events occur, the SPS will pop up alarm dialog or shut down the computer gracefully.
  Unselect the alarms checkbox in the Event list: When the events occur, the SPS will not pop up alarm dialog and will not shut down the computer.

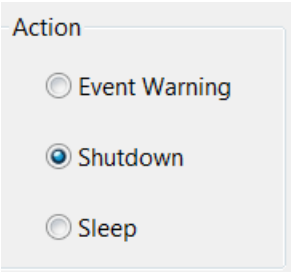


Supported Alarms:

Alarm	Default Setting
Ac Fail	checked
Battery Low	checked

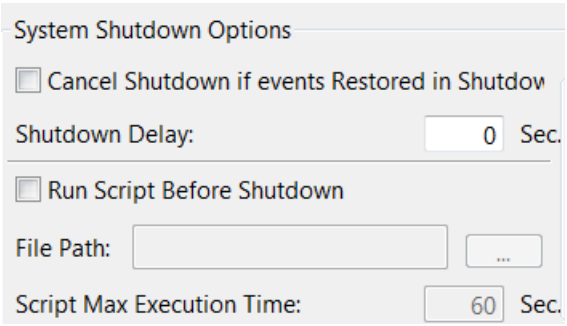
UPS Overload	unchecked
UPS Over Temperature	unchecked
Weekly Schedule Shutdown	checked
Specific Day Schedule Shutdown	checked
EMP Over Temperature	unchecked
EMP Over Humidity	unchecked
EMP Contact1 Alarm	unchecked
EMP Contact2 Alarm	unchecked
Battery Capacity Below Limit	checked (The SPS version should be 1.3.0.3 or later)
Battery Backup Time Below Limit	checked (The SPS version should be 1.3.0.3 or later)

- In the Action option, select Event Warning, Shutdown, or Sleep button。
  By the default, “Shutdown” is selected



Action	Definition
Event Warning	When the events occur，The SPS will pop up the alarm dialog, but the system will not be shut down or sleep.
Shutdown	When the shutdown condition is met, the system will be shut down
Sleep	When the shutdown condition is met, the system will be sleep

- In the System shutdown options, set the shutdown parameters.

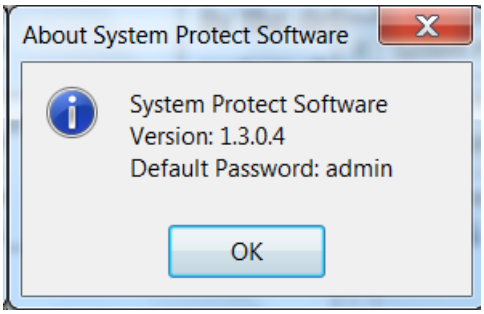


The parameters are defined as following: (For more information, please refer to section 8.3)

Shutdown Parameters	Definition
Cancel Shutdown if events	Checkbox is selected: The shutdown (sleep) will be

Restored in Shutdown Delay	cancelled during shutdown delay timer counting down if the events restore to normal. Checkbox isn't selected: The system will be shut down (sleep) during shutdown delay timer counting down even if the events restore to normal. The checkbox isn't chosen as default.
Shutdown Delay	The system begins to shut down after shutdown delay time counting down to 0. The shutdown Delay is 0 s as default.
Run Script Before Shutdown	If the checkbox is selected, the Script will be executed before the system shutdown (sleep). By the default, the SPS will not execute the script before system shutdown.
Script Max Execution Time	The script will be ended when the max execution time is met. The script max execution time is 60s as default.

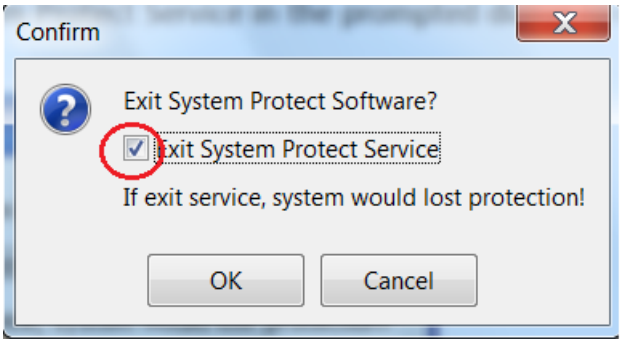
- Click "System"-> "about", check the software version



- Click "Log"-> "Event log", check the SPS events log

2.4 Uninstall the SPS

- Right click the Tray Icon, select Exit.
  Select the Exit System Protect Service in the prompted dialog to exit the SPS user interface and SPS service。



- Select Start menu > All Programs > System Protect Software > Uninstall System Protect Service, uninstall the SPS

2.4 Configuring the Port

The SPS use UDP 3034 as the communication port with NMC as default. Please open the port according the command as below:

```
netsh.exe firewall add portopening udp 3034 SPSPort
```

Note: If the UDP 3034 is captured by the other program, the number of the port value will be added 1(range from 3034~3083)

3 Installation and configuration in Linux, MAC OS and Unix

3.1 Installing the SPS

-

Operation System	packages
Linux i386 with GUI (Graphics User Interface Mode)	SPS-GUI-*.*.*.*-linux-i386.tar.gz SPS-CUI-*.*.*.*-linux-i386.tar.gz The two packages above are supported in GUI mode
Linux i386 with CUI（Console User Interface Mode）	SPS-CUI-*.*.*.*-linux-i386.tar.gz
Linux AMD 64 with GUI(Graphics Mode)	SPS-GUI-*.*.*.*-linux-x86_64.tar.gz SPS-CUI-*.*.*.*-linux- x86_64.tar.gz The two packages above are supported in GUI mode
Linux AMD 64 with CUI（Console Mode）	SPS- CUI-*.*.*.*-linux-x86_64.tar.gz
MAC OS 10.7and later for Intel	SPS-intel-*.*.*.*-MACOS.tar.gz
MAC OS 10.6 for Intel	SPS-*.*.*.*-MACOSX-10.6-intel.tar.gz
MAC OS 10.5 for PPC	SPS-*.*.*.*-MACOSX-10.5-ppc.tar.gz
Solaris 10 for Intel	SPS-CUI-*.*.*.*-solaris-intel.tar.gz
Solaris 10 for Sparc	SPS-CUI-*.*.*.*-solaris-sparc.tar.gz

- Extract the file, Enter the command:
  tar –zxvf SPS*
  Note: for the solaris OS, please extract as following:
  gunzip SPS*.tar.gz
  tar –xvf SPS*.tar
- Installing the file, Enter the command:
  ./SPS.install
- Finish the installation, Enter “y”
- By default, the SPS is installed to the path “/opt/sps”

3.2 Starting the SPS

3.2.1 Linux (MAC OS) with GUI

- SPS service will run automatically in the background when the system boot.
  Start or stop the SPS service when the system boots by the following command in table.

Operation System	Starting the SPS Service when system boot	Stopping the SPS Service when system boot
RedHat	chkconfig --add SPSService	chkconfig --del SPSService
SUSE	chkconfig --add SPSService	chkconfig --del SPSService
Ubuntu	sudo update-rc.d SPSService defaults	sudo update-rc.d –f SPSService remove
MAC OS	sudo launchctl load /Library/LaunchDaemons/SPSService.plist	sudo launchctl unload /Library/LaunchDaemons/SPSService.plist

- Start the SPS service manually ,go to the installation directory, enter the command:
  ./SPSService
- For the Linux , Start the SPS user interface in the installation directory, enter the command：
  ./SPS
  For the MAC OS, Start the SPS user interface in the installation directory, enter the command：
  open SPS.APP
  The packages in the below table are needed. In generally, the packages will be installed in the system as default:

Library Name	Provided by Package	Super Package
gtk-x11-2.0	gtk2	
gdk_pixbuf-2.0	gtk2	
gthread-2.0	libgthread-2_0-0	glib2
glib-2.0	glib2	glib2
gmodule-2.0	libgmodule	glib2
gobject-2.0	libgobject-2_0-0	glib2
atk-1.0	atk/libatk	
pango-1.0	pango	
freetype	freetype2	
fontconf	fontconfig	
Xrender	xorg-x11-libXrender	xorg-x11
x11	xorg-x11-libX11	xorg-x11
Xext	xorg-x11-libX11	xorg-x11
png12	libpng12-0	
z	zlib	

3.2.2 Linux (Unix) with CUI

Note: The GUI mode of SPS for Unix OS is not supported. Please use the CUI mode of SPS for Unix.

- Start the SPS service in the installation directory, enter the command:
  ./SPS –s
  Restart the SPS service if necessary, Enter the command: **./SPS -r**
  SPS service starts automatically at system boot as default.

- The SPS user interface is unavailable in the Linux with CUI，refer to the SPS command parameters in the below table：

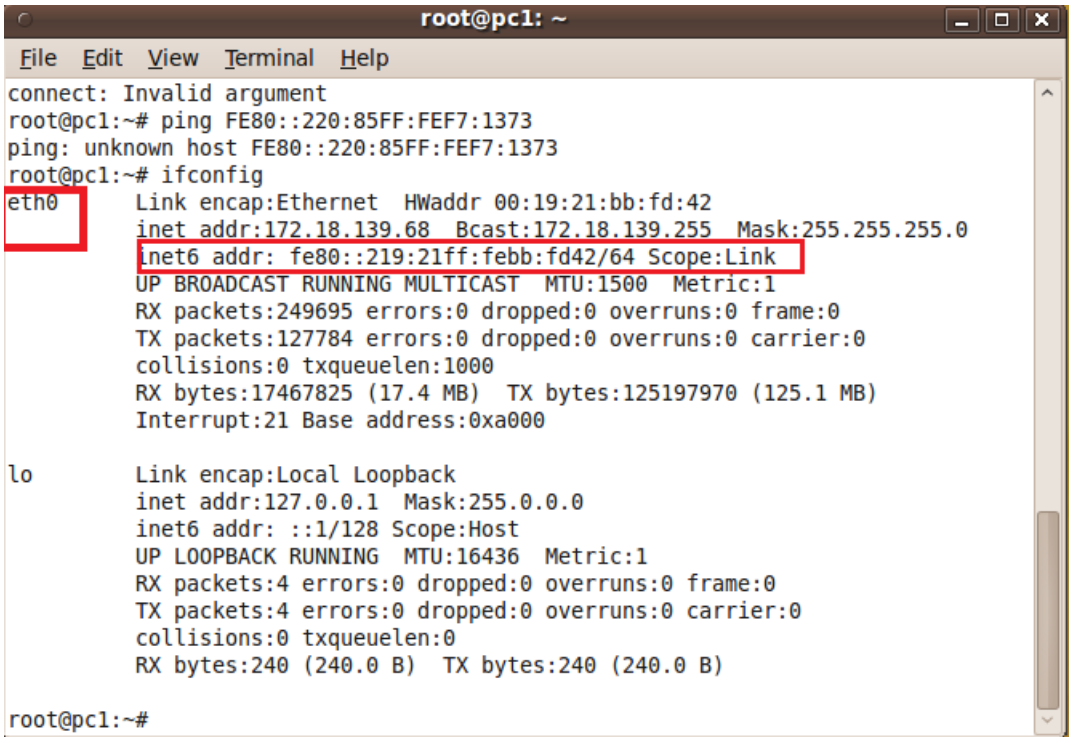
Parameter	Function	Comment
-h	Print all the parameters and functions	
-v	Show the software version and copyright	
-S	Start SPS service automatically at system boot	Take effect at next boot
-X	Stop SPS service at system boot	Take effect at next boot
-s	Start SPS service	Take effect immediately
-x	Exit SPS service	Take effect immediately
-r	Restart SPS service	Take effect immediately
-l	List all the device and status	
-p	Check the shutdown parameters	
-i	Modify the configuration parameters	Enter the password, edit the configuration by the vi tool
-c	Modify the password	Enter the old password, then input the new password

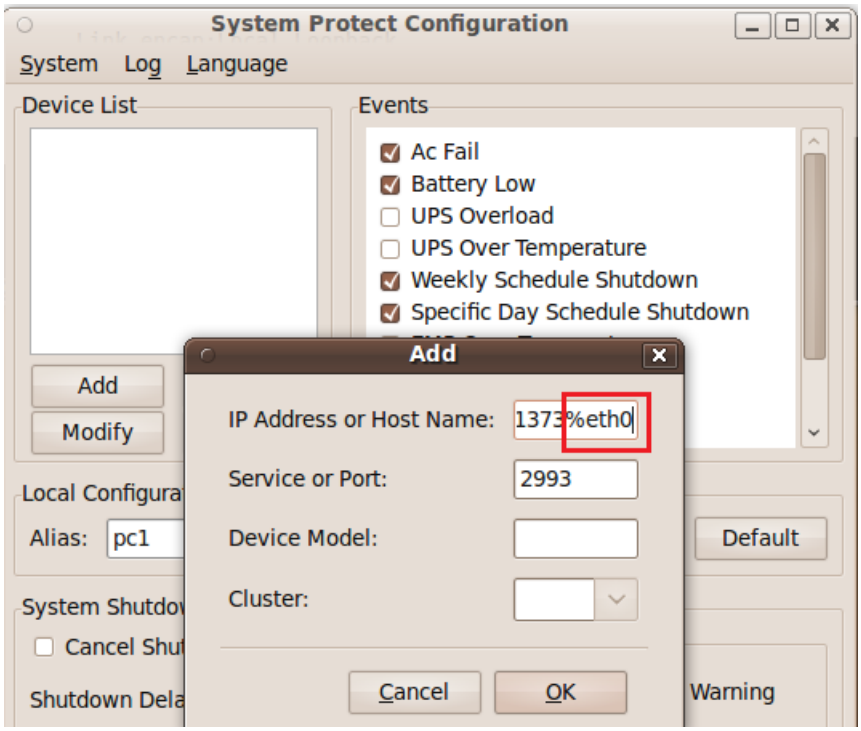
3.3 Configuring the SPS

3.3.1 Linux (MAC OS) with GUI

Refer to the SPS configuration in Windows (section 2.3)

Note: Please add the network id as suffix at the end of IPV6 address (for example: %eth0) as the below image if the IP address is IPV6.





3.3.2 Linux (Unix) with CUI

Note: The GUI mode of SPS for Unix OS is not supported. Please use the CUI mode of SPS for Unix.

- Enter the command：**./SPS –i** .
  Input the password, the password is admin as default. Open the configuration by “vi” tool.

- Modify the parameters configuration, save and exit.

3.3.2.1 Add one device, or set the Redundant UPS Input if the computer is protected by multi-devices.

Note. The SPS version should be 1.5.0.2 or later for Load segment function.

- Add one device. Add the NMC IP address in the "name" parameter. (e.g the NMC IP address is 172.18.139.60). If the UPS support Load segment, set the "powerby" parameter as **LS1** or **LS2**. If the UPS don't support Load segment, set the "powerby" parameter as **Master**.

  Format as below:

  <RemoteList>

  <Remote name="172.18.139.60" serv="2993" model="" powerby="LS1"/>

  </RemoteList>

  Or you can use the following format also:

  <RemoteList>

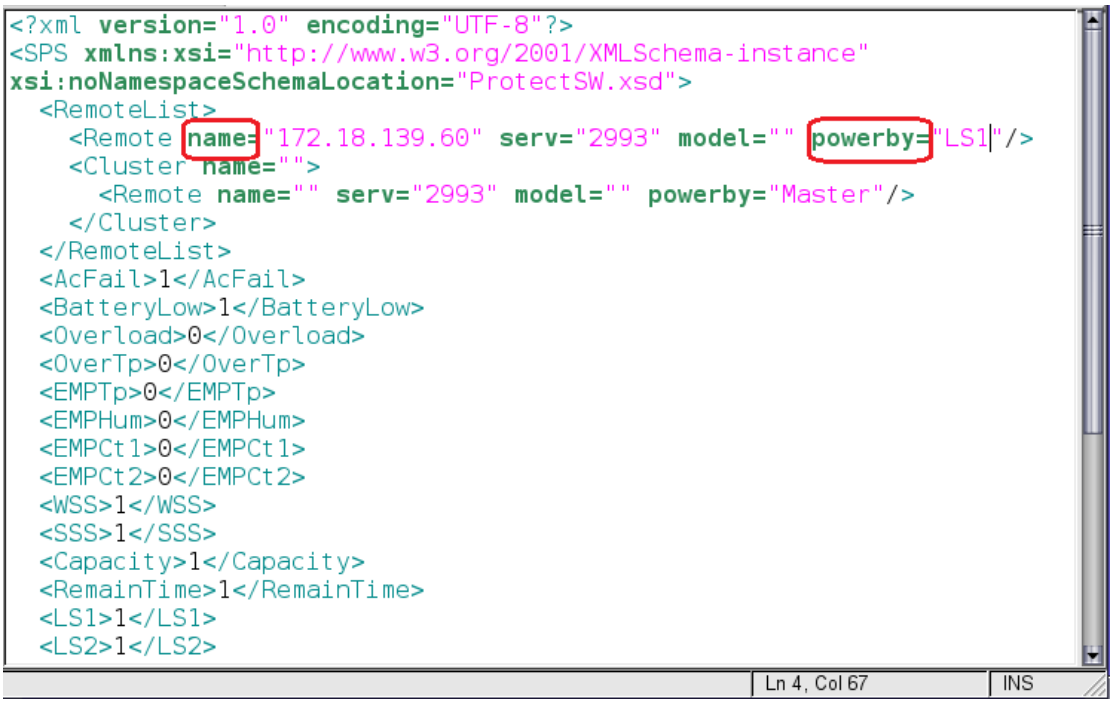
  <Remote name="172.18.139.60" serv="2993" model="" powerby="LS1"/>

  <Cluster name="">

  <Remote name="" serv="2993" model=""/>

  </Cluster>

  </RemoteList>



- Add redundant devices in groups, system will be shutdown whenever any of the group met the shutdown condition.

  If the UPS support Load segment, set the "powerby" parameter as **LS1** or **LS2**. If the UPS don't support Load segment, set the "powerby" parameter as **Master**.

  For example:

  The IP address of NMC is 172.18.127.65 and 172.18.127.66 in group1

  The IP address of NMC is 172.18.127.73 and 172.18.127.74 in group2

Format as below:

```
<RemoteList>
    <Cluster name="group1">
        <Remote name="172.18.127.65" serv="2993" model="" powerby="Master"/>
        <Remote name="172.18.127.66" serv="2993" model="" powerby="Master"/>
    </Cluster>
    <Cluster name="group2">
        <Remote name="172.18.127.73" serv="2993" model="" powerby="Master"/>
        <Remote name="172.18.127.74" serv="2993" model="" powerby="Master"/>
    </Cluster>
</RemoteList>
```

Note: Please add the network id as suffix at the end of IPV6 address (for example: %eth0) if the communication mode is IPV6. Refer to the section "3.3.1 Linux (MAC OS) with GUI".

3.3.2.2 Set the alarm attribute

Enable the alarm, set the value to 1. The SPS will pop up alarm in the console and protect the system to shut down gracefully.

Disable the alarm, set the value to 0. The SPS will not pop up alarm and will not shut down the system.

The default setting as below：

<AcFail>1</AcFail>
<BatteryLow>1</BatteryLow>
<Overload>0</Overload>
<OverTp>0</OverTp>
<EMPTp>0</EMPTp>
<EMPHum>0</EMPHum>
<EMPCt1>0</EMPCt1>
<EMPCt2>0</EMPCt2>
<WSS>1</WSS>
<SSS>1</SSS>
<Capacity>1</Capacity>
<RemainTime>1</RemainTime>

Event parameters	Alarm
<AcFail>	Ac Fail
<BatteryLow>	Battery Low
<Overload>	UPS Overload
<OverTp>	UPS Over Temperature
<WSS>	Weekly Schedule Shutdown
<SSS>	Specific Day Schedule Shutdown
<EMPTp>	EMP Over Temperature
<EMPHum>	EMP Over Humidity
<EMPCt1>	EMP Contact1 Alarm
<EMPCt2>	EMP Contact2 Alarm

<Capacity>	Battery Capacity Below Limit (The SPS version should be 1.3.0.3 or later)
<RemainTime>	Battery Backup Time Below Limit (The SPS version should be 1.3.0.3 or later)

3.3.2.3 Set the shutdown parameters

<CancelIf>0</CancelIf>

<ShutDelay>0</ShutDelay>

<EnableScript>0</EnableScript>

<Script></Script>

<MaxScriptTime>60</MaxScriptTime>

For more information, please refer to section 8.3

Shutdown Parameters	Definition
Cancel Shutdown if events Restored in Shutdown Delay <CancelIf>0</CancelIf>	If the value is 0, the system will be shut down (sleep) in shutdown delay even if the events restore. If the value is 1, the shutdown (sleep) will be cancelled in system delay if the events restore.
Shutdown Delay <ShutDelay>0</ShutDelay>	The system begins to shut down after shutdown delay time counting down to 0 The shutdown Delay is 0 s as default.
Enable or disable the Script <EnableScript>0</EnableScript>	If the value is 1, enable to run the script If the value is 0, disable to run the script
Run Script Before Shutdown <Script></Script>	Enter the path of the script; the script will be executed before the system shutdown (sleep). By the default, the SPS will not run the script before system shutdown. For example: <Script>/opt/sps/shutdown.sh</Script>
Script Max Execution Time <MaxScriptTime>60</MaxScriptTime>	The script will be ended when the max execution time is met. The script max execution time is 60s as default

3.3.2.4 Set the actions

<Action>1</Action>

Note: The system should have hibernation function if the action is set to 2.

Action	Definition
Event Warning (The action value is set to 0)	When the events occur， The SPS will pop up the alarm dialog, but the system will not be shut down or sleep.
Shutdown (The action value is set to 1)	When the shutdown condition is met, the system will be shut down
Sleep	When the shutdown condition is met, the system will be

(The action value is set to 2)	sleep

- Restart the SPS service after configuration end, Enter the command:
  ./SPS –r

- View the device status by the command:
  ./SPS –l
  For example: The device status for 172.18.127.65 as below image.

```
[root@PC001 sps]# ./SPS -l
172.18.127.65[group1]
Device Mode: CLK
IP Address: 172.18.127.65
Host Name: Unknown
Connection Status: Connected
Shutdown Status: Normal
UPS Shutdown Delay: 2s
```

- View the shutdown configuration by the command:
  ./SPS –p
  For example, the shutdown configuration as below image：

```
[root@PC001 sps]# ./SPS -p
Event Accepted:
Ac Fail: enable
Battery Low: enable
UPS Overload: enable
UPS Over Temperature: enable
Weekly Schedule Shutdown: enable
Specific Day Schedule Shutdown: enable
EMP Over Temperature: enable
EMP Over Humidity: enable
EMP Contact1 Alarm: enable
EMP Contact2 Alarm: enable

Ignore restore event in shutdown delay: enable
Shutdown delay: 0s

Run script before shutdown: disable
```

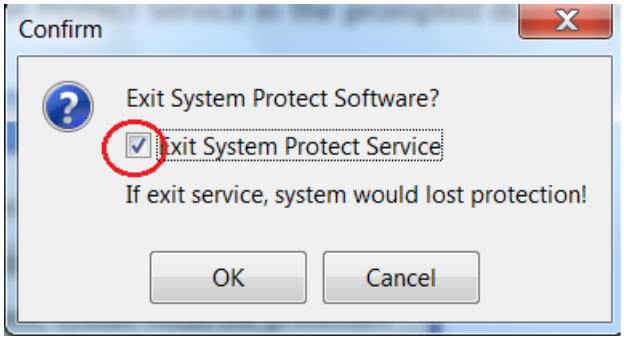
- Modify the password, enter the command:**./SPS –c**

3.3.2.5 Check the log

Go to the SPS installation path "/opt/sps". Check the document "ProtectSW.txt"

3.4 Uninstall the SPS

- Exit the SPS user interface， Select the Exit System Protect Service in the prompted dialog to exit the SPS service。



For the Linux with CUI, exit the SPS service, run the command: **./SPS –x**

- Uninstall the SPS, enter the command in the directory where the installation package extracted:
  ./SPS.remove

3.5 Configuring the Port

- The SPS use UDP 3034 as the communication port with NMC by default.
  Note: If the UDP 3034 is captured by the other program, the number of the port will be added 1(range from 3034~3083)

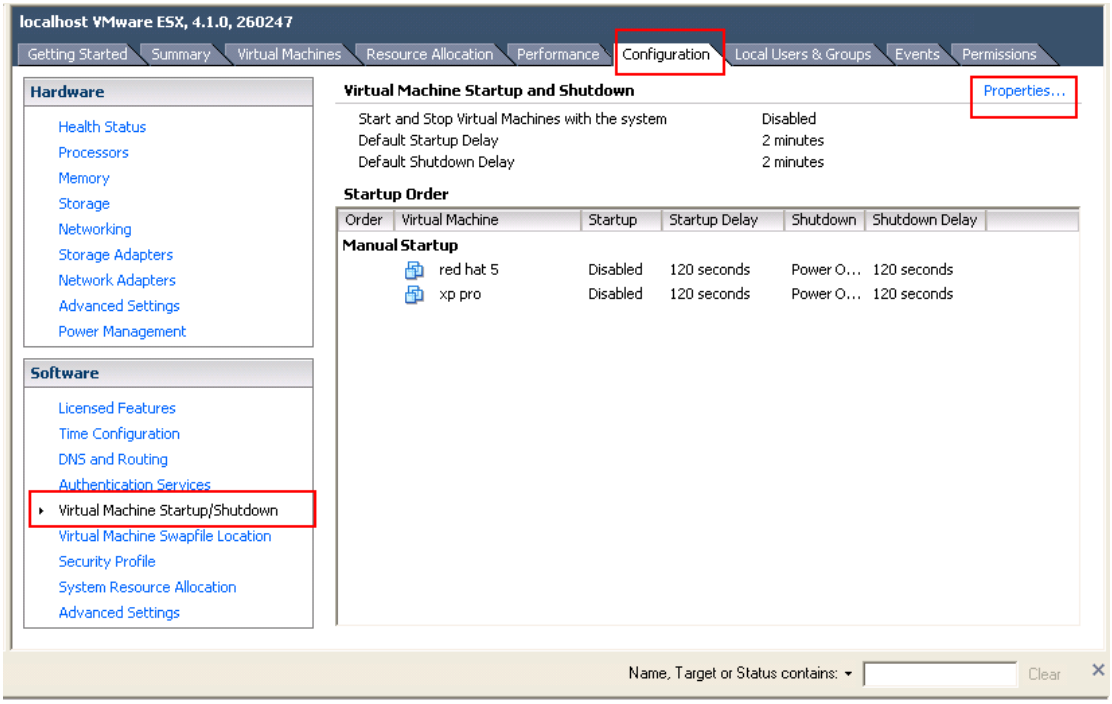
- Open the UDP port by the following command:
  iptables -I INPUT -p udp --dport 3034 -j ACCEPT
  iptables -I OUTPUT -p udp --dport 3034 -j ACCEPT
  /etc/rc.d/init.d/iptables save

4 Installation and configuration for SPS in the VMware ESX

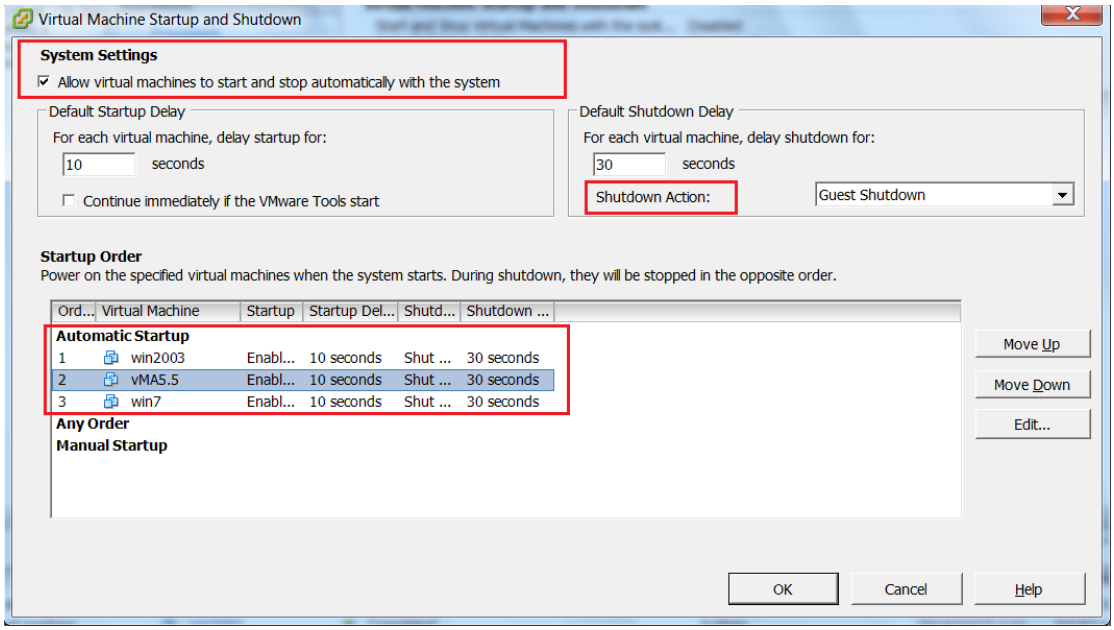
4.1 Configuring for VMware ESX

4.1.1 Configuring VMs startup/shutdown automatically

- Start VMware Client, select Configuration -> Virtual Machine Startup/Shutdown->Properties

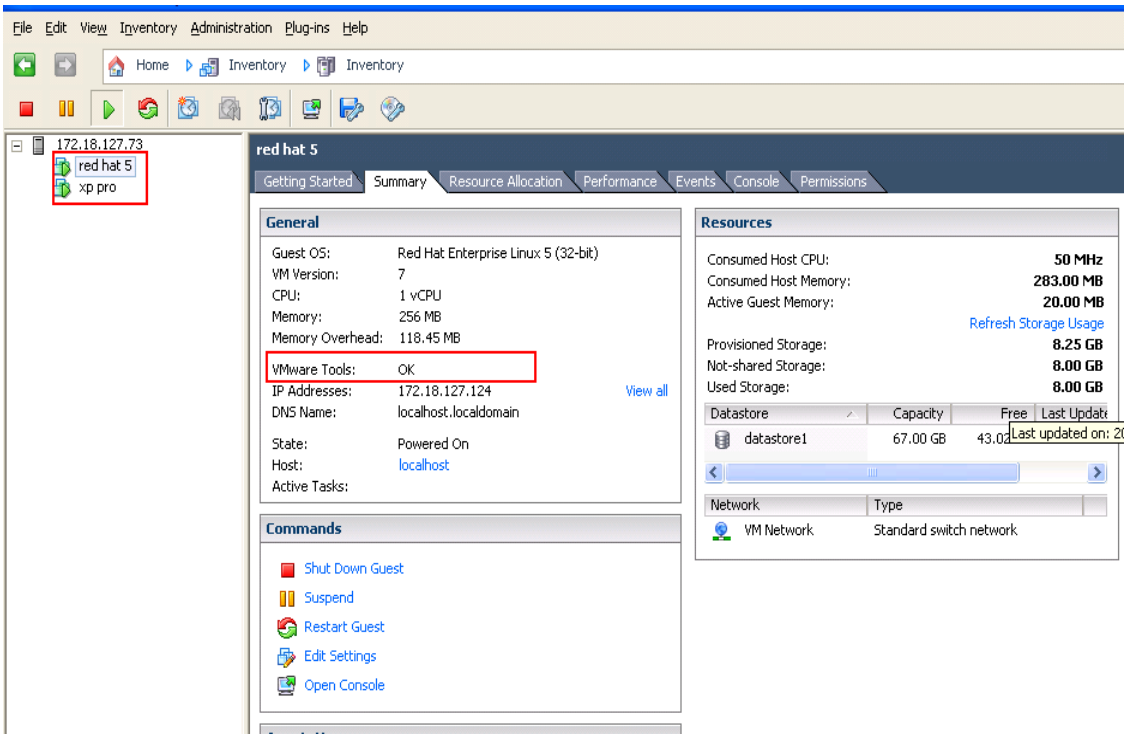


- Select Allow virtual machines to start and stop automatically with the system checkbox.
  Enter the settings as shown on the Virtual Machine Startup and Shutdown window:
  Move up the virtual machines to the Automatic Startup list.
  The virtual machines will start/stop when the host start/shutdown automatically.



4.1.2 VMware tools

- Install the VMware tool for each guest OS.
  Select the guest OS, click summary menu, the status for VMware tools will show OK if the VMware tools is installed successfully.



4.1.3 Configuring the Port

- The SPS use UDP 3034 as the communication port with NMC as default.

Note: If the UDP 3034 is captured by the other program, the number of the port will be added 1(range from 3034~3083)

- Open the UDP port by the following command:
  esxcfg-firewall -o 3034,udp,in,SPS
  esxcfg-firewall -o 3034,udp,out,SPS

4.2 Configuring the SPS

- Start the VMware Server host, refer to the chapter 3 (Linux with CUI) to finish the SPS Installation and configuration.

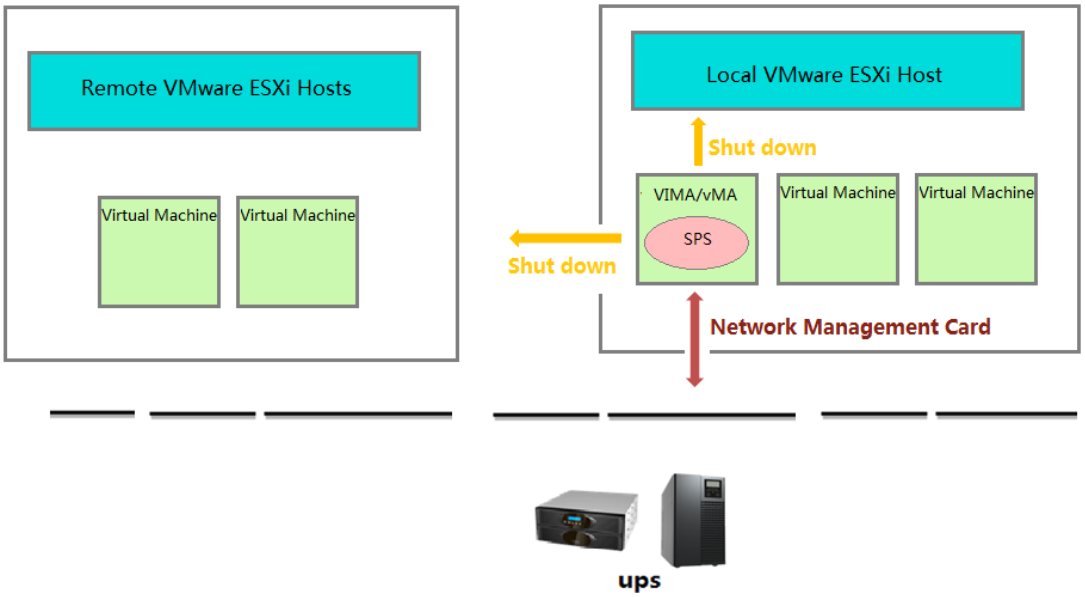
- Set the shutdown script for VMware ESX. The document of shutdownESX.sh is the script for shut down the virtual machines。
  Enter the command: **./SPS -i**
  Find the two lines in the configuration and edit it as below:
  <EnableScript>1</EnableScript>
  <Script>**/opt/sps/ShutdownScript/shutdown**</Script>

- Set the Script Max Execution Time based on the amount of Virtual machines. Set apart 30s for each virtual machine.
  For example: there are ten virtual machines:
  Enter the command: **./SPS -i**
  Find the line in the configuration and edit it as below:
  <MaxScriptTime>300</MaxScriptTime>

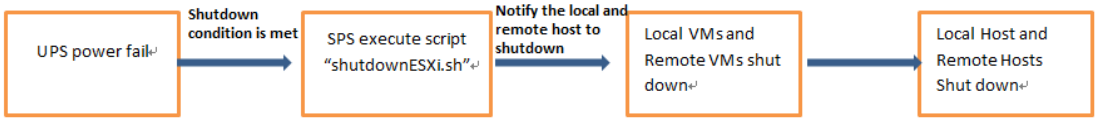
- Restart the SPS service by the command: **./SPS –r**

5 Installation and configuration for SPS in the VMware ESXi (paid version)

Over viewer



Shutdown Sequence



- The full name for the vMA is "vSphere Management Assistant", it is released by the VMware company to manage the vSphere
- The script "shutdownESXi.sh" is used to notify the local ESXi host and the remote ESXi hosts to shut down.
  If the script "shutdownESXi.sh" is executed on the general OS, the executed permission will be refused
- The Virtual Machines on the ESXi host are shut down automatically by the ESXi host with the "Allow virtual machines to start and stop automatically with the system" function. So the local and remote ESXi hosts should enable "Allow virtual machines to start and stop automatically with the system" function. please refer to section "5.1.2 Configuring VMs startup/shutdown automatically"
- Run the config.pl to save the local and remote ESXi hosts IP address and corresponding username and password, the information is saved in the "hostlist".
  When runs the "shutdownESXi.sh" to notify the ESXi hosts to shut down, it needs to

provide the ESXi hosts username and password to pass through the verification.

- The local and remote ESXi hosts will accept the shutdown notification from vMA with right password and take effect to shut down

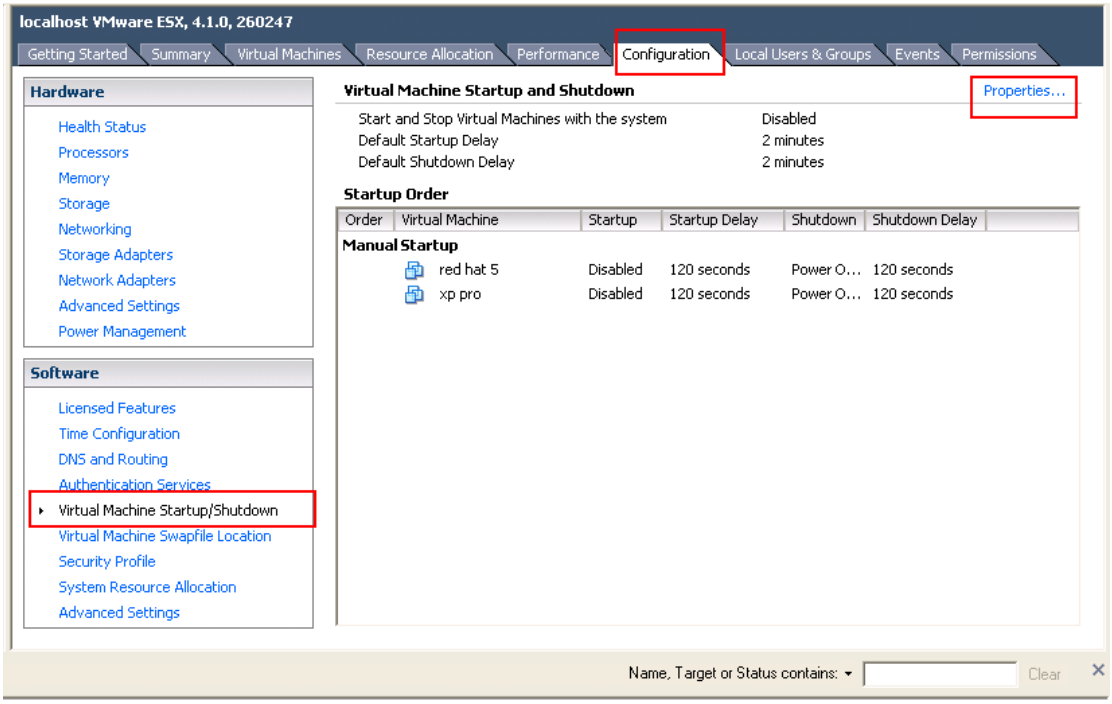
5.1 Configuring for VMware ESXi

5.1.1 Installing and configuring the VMA

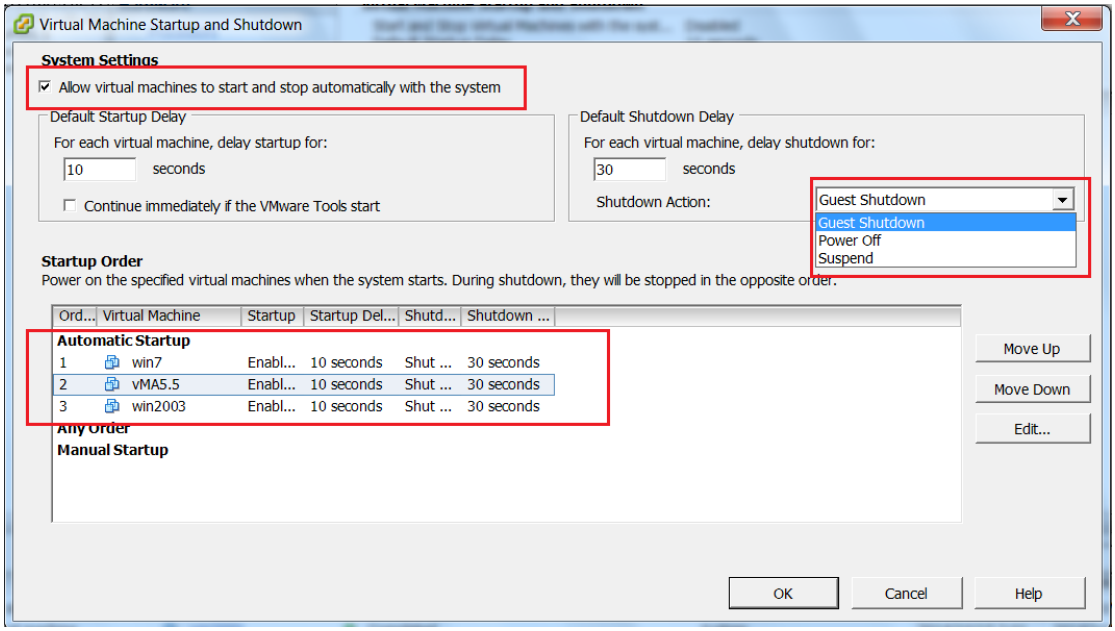
- Go to the website :http://www.vmware.com/support/developer/vima/
  Download the VMA, and extract it, the format for the VMA document is *.OVF.
- Start the VMware Client, select File > Deploy OVF Template, click the browse button, select the OVF document.
- Start VMA, the default user name is vi-admin. Set the password for the first login.

5.1.2 Configuring VMs startup/shutdown automatically

- Start VMware Client, select Configuration -> Virtual Machine Startup/Shutdown->Properties



- Select Allow virtual machines to start and stop automatically with the system checkbox.
  Enter the settings as shown on the Virtual Machine Startup and Shutdown window:
  Move up the virtual machines to the Automatic Startup list
  The virtual machines will start/stop when the host start/shutdown automatically.

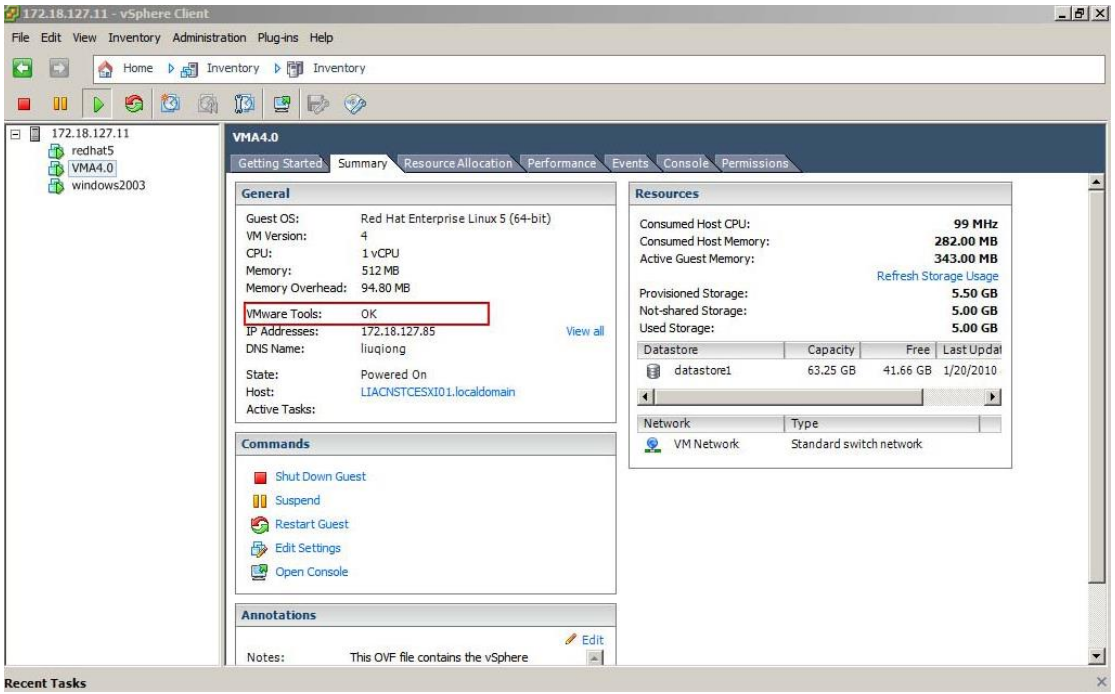


Note: if the "Guest shutdown" is selected in the "Shutdown Action", make sure the VMware tools are installed for each virtual machine. If the "Power off" is selected in the "Shutdown Action", the VMware tools are not needed for the virtual machine.

Please refer to the official website for more VMware tools information.

If the OS is Windows, right click one of the VMs, click **Guest -> Install/Upgrade VMware Tools**

After the VMware tools installation, the VMware tools status will be changed to "OK" from the Summary



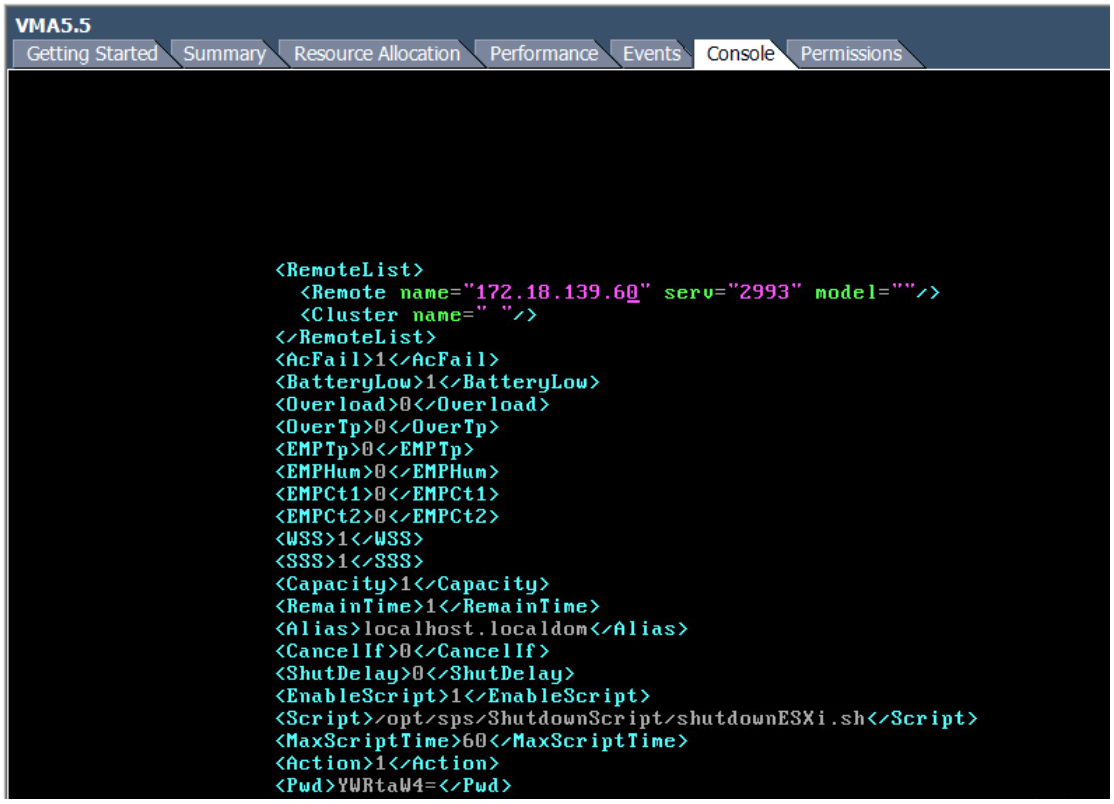
5.1.3 Configuring the port

- The SPS use UDP 3034 as the communication port with NMC as default.
  The port is opened as default in the vMA.
  Note: If the UDP 3034 is captured by the other program, the value of the port will be added 1(range from 3034~3083)

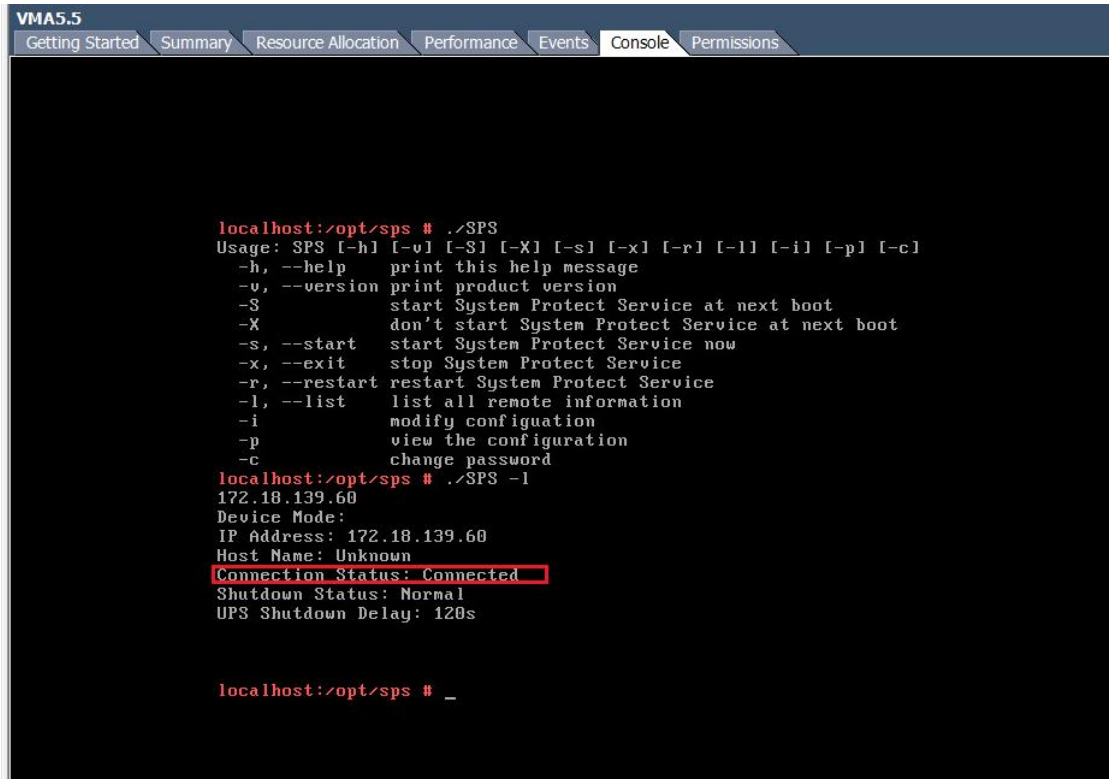
- Neglect this step unless the port is disabled：
  iptables -I INPUT -p udp --dport 3034 -j ACCEPT
  iptables -I OUTPUT -p udp --dport 3034 -j ACCEPT
  /etc/rc.d/init.d/iptables save (for the ESXi 5.5 and later, this command can be neglected)

5.2 SPS Configuration

- Start VMA, refer to the chapter 3 (Linux with CUI) to finish the SPS Installation and configuration.
  Note: please add with “sudo” if the user isn’t root user.
  For example: (the NMC IP address is 172.18.139.60)
  1. Enter the /opt/sps directory, start the SPS service by the command: **sudo ./SPSService**
  2. Open the configuration document by the command: **sudo ./SPS –i**
     Input the password: **admin**
  3. Add the NMC IP address
     ```
     <RemoteList>
         <Remote name="172.18.139.60" serv="2993" model=""/>
     </RemoteList>
     ```



4. Restart the SPS Service by the command: **sudo ./SPS –r**
5. List the added NMC by the command: **sudo ./SPS –l**



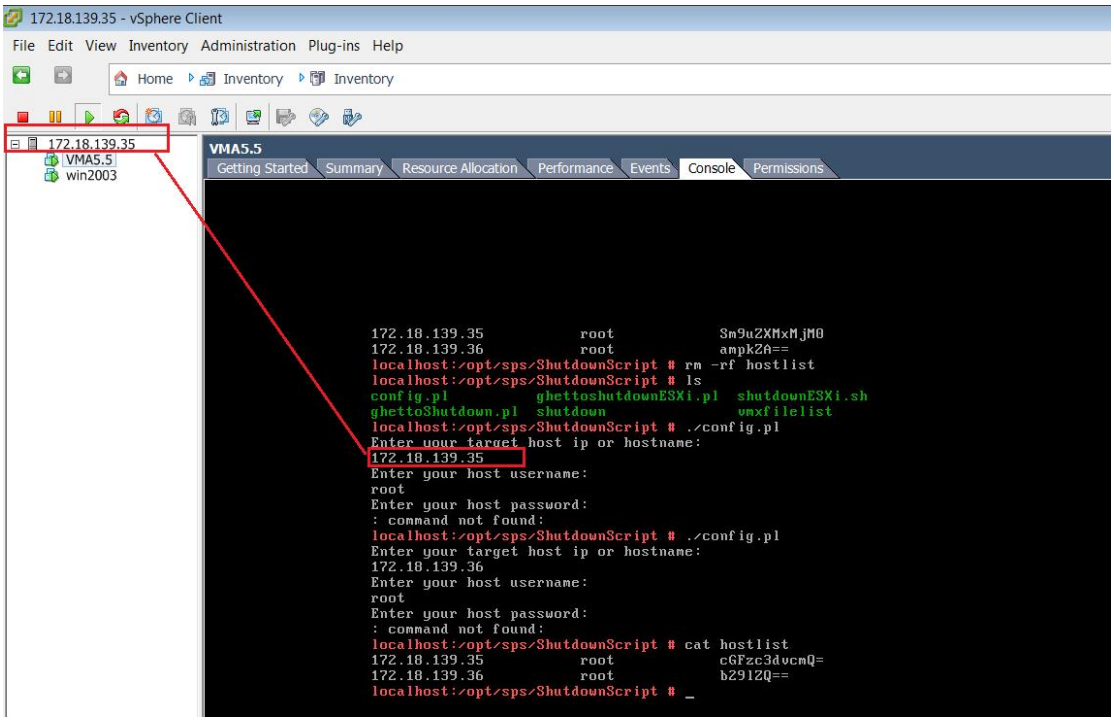
- The config.pl is used to add the local ESXi host and remote ESXi hosts to be shutdown.
  Go to the "ShutdownScript" subdirectory: **cd /opt/sps/ShutdownScript**

Enter the command: **sudo ./config.pl**

Input the target VMware ESXi local host IP (or hostname), username, password. SPS supports multi-hosts shutdown.

Also, you can input the target VMware remote ESXi hosts IP (or hostname), username, password.

For example: 172.18.139.35 and 172.18.139.36 will be added:

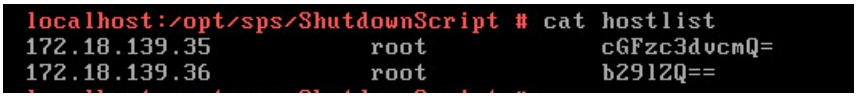


Note: SPS supports multi-hosts shutdown，but the local and remote ESXi hosts should enable "Allow virtual machines to start and stop automatically with the system" function, please refer to section "5.1.2 Configuring VMs startup/shutdown automatically".

The VMware host information will be saved in hostlist document.

Enter the command: **cat hostlist,** get the input hosts information

Note: The password will be encrypted.



- Set the shutdown script for VMware ESXi. The shutdownESXi.sh is the script to shut down the ESXi hosts.

  Enter the command: **sudo ./SPS -i**

  Find the two lines in the configuration and edit it as below:

  <EnableScript>1</EnableScript>

  <Script>**/opt/sps/ShutdownScript/shutdownESXi.sh**</Script>

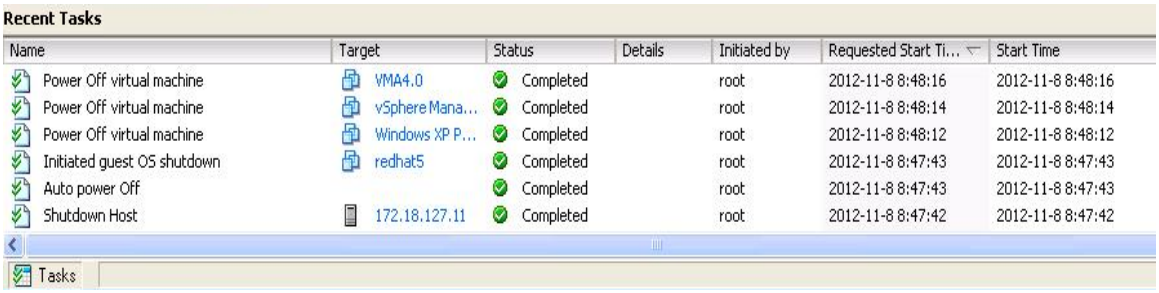
- Set the Script Max Execution time. Time based on the amount of Virtual machines.

  For example: set he max script time to 1 minute

Enter the command: **sudo ./SPS -i**
Find the line in the configuration and edit it as below:
<MaxScriptTime>**60**</MaxScriptTime>

- Restart the SPS service, enter the command : **sudo ./SPS –r**

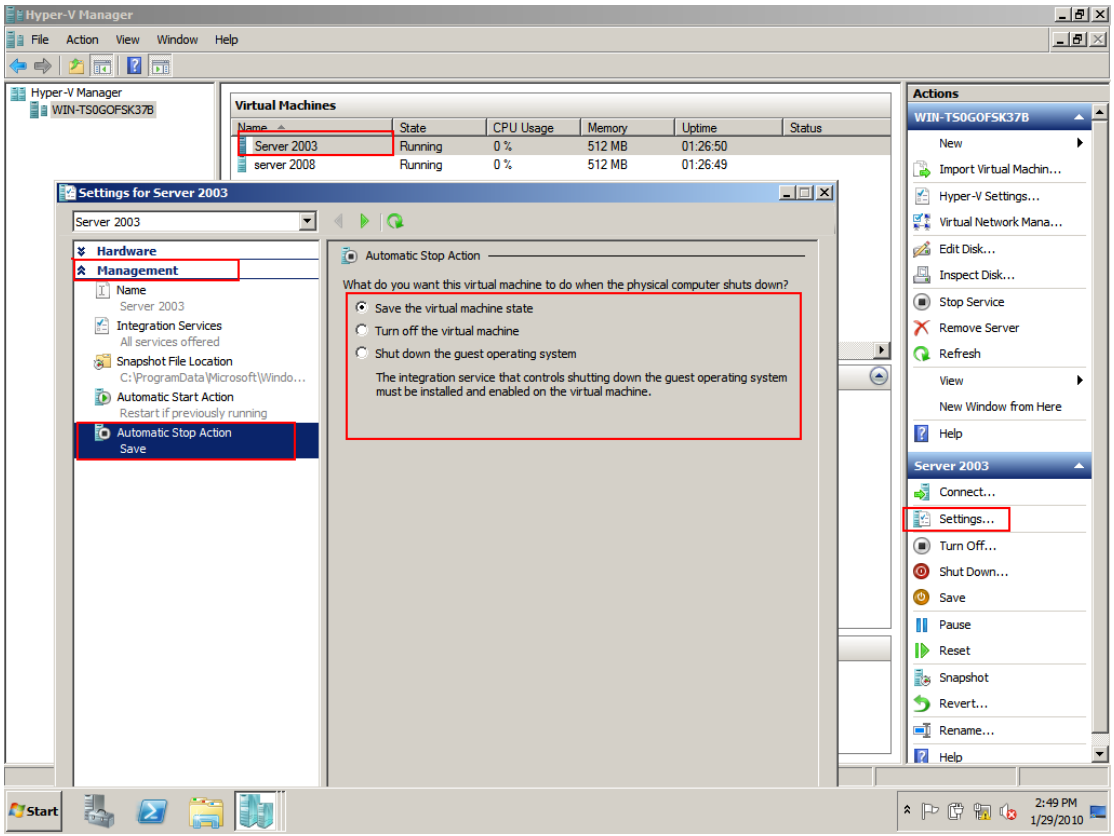
- The time sequence for host and VMs shutdown can be seen by VMware client.
  cd /opt/sps/ShutdownScript
  Please run the script "**sudo ./shutdownESXi.sh**" first to check if the setting is correct and check if the local and remote ESXi hosts and VMs can be shut down
  The shutdown sequence as below image:



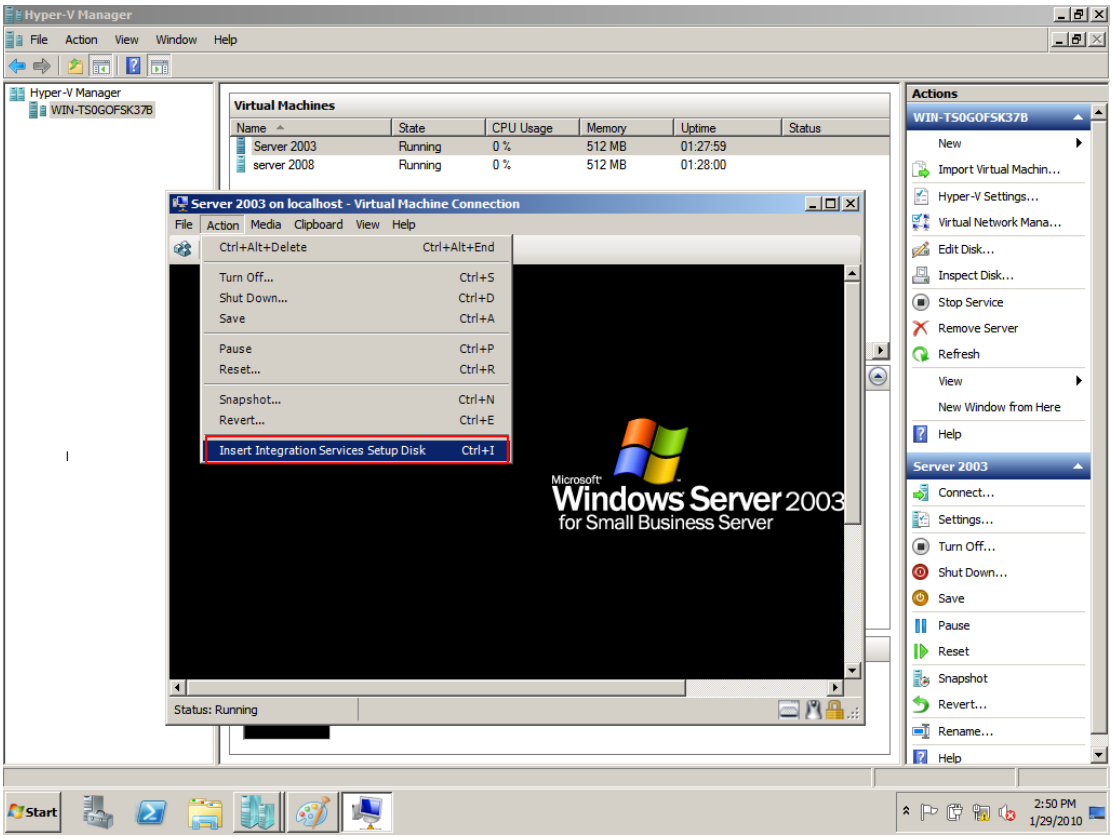
6 Installation and configuration for SPS in the Hyper-V Server

6.1 Hyper-V configuration

- Start Hyper-V Manager in the client
  For example: there are two virtual machines, Windows server 2003 and 2008.
  Select the VM. Click Setting ->“Automatic Stop Action Save”, there are three methods.
  Save the virtual machine state：
  Turn off the virtual machine：
  Shut down the guest operating system：

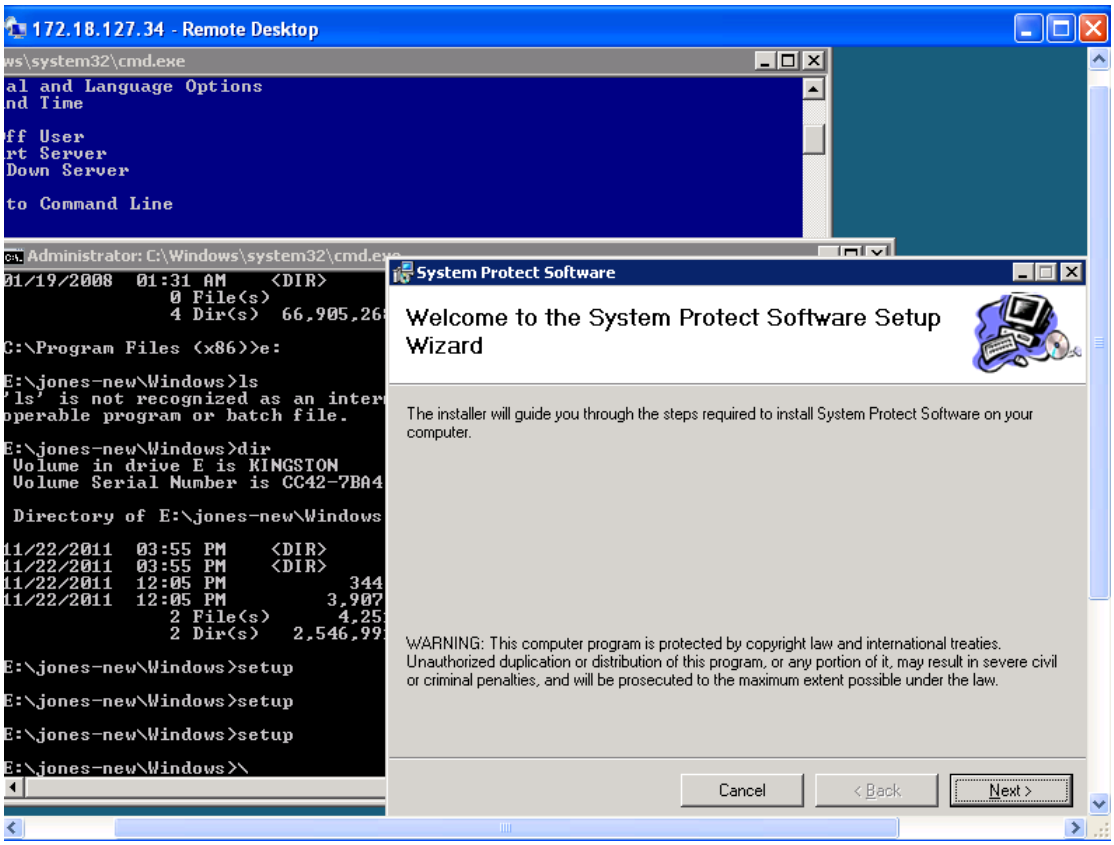


- If the third method is selected, install the “Integration Service” in the Action menu

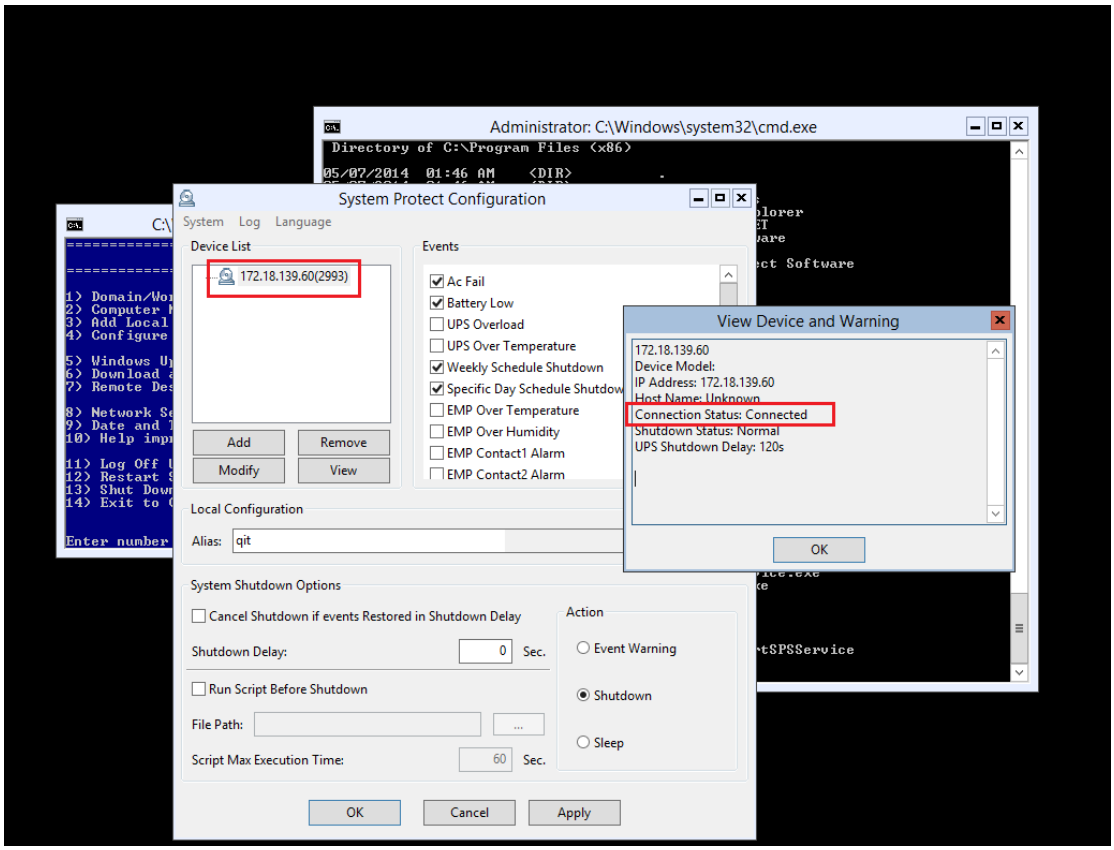


6.2 Installing and configuring the SPS

- Copy the installation file “setup.exe” to Hyper-V server 2008, enter the path where the installation file exists
- Install the SPS, enter the command: setup.exe.
  By the default, the SPS file is installed to the directory C:\Program Files\System Protect Software for the 32 bit windows. And it is installed to the directory C:\Program Files(x86)\System Protect Software for the 64 bit windows.



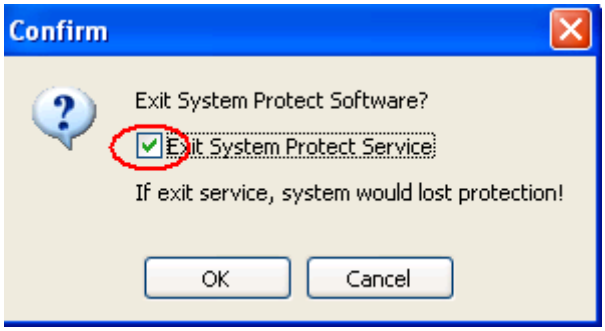
- Enter to the installation path: cd C:\Program Files(x86)\System Protect Software
  Start SPS service and user Interface by the command: StartSPSService.exe
  Add the NMC IP address in the SPS interface



- Refer to the chapter 2.3 to finish the SPS configuration.
  The SPS Service will be started automatically when the system boots
  If the parameters need to be set, open the SPS interface by the command: SPS.exe

6.3 Uninstall the SPS

- Close the SPS user interface.

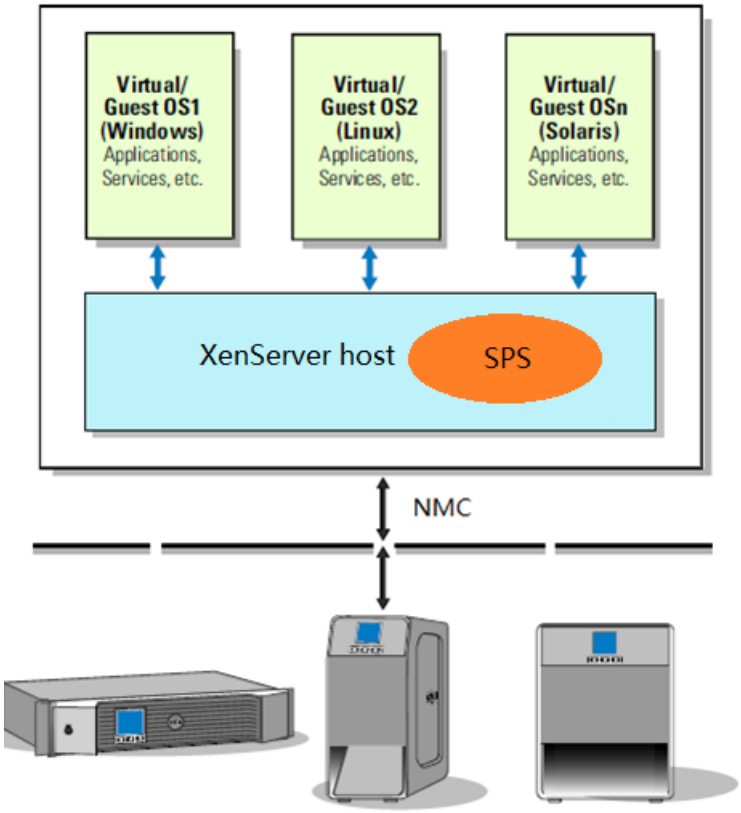


- Enter to the directory where the installation package existed. Enter the command: setup.exe:

7 Installation and configuration for SPS in the Citrix XenServer

SPS is installed on the XenServer host. When the shutdown condition is met, the SPS will notify the XenServer host to shutdown.

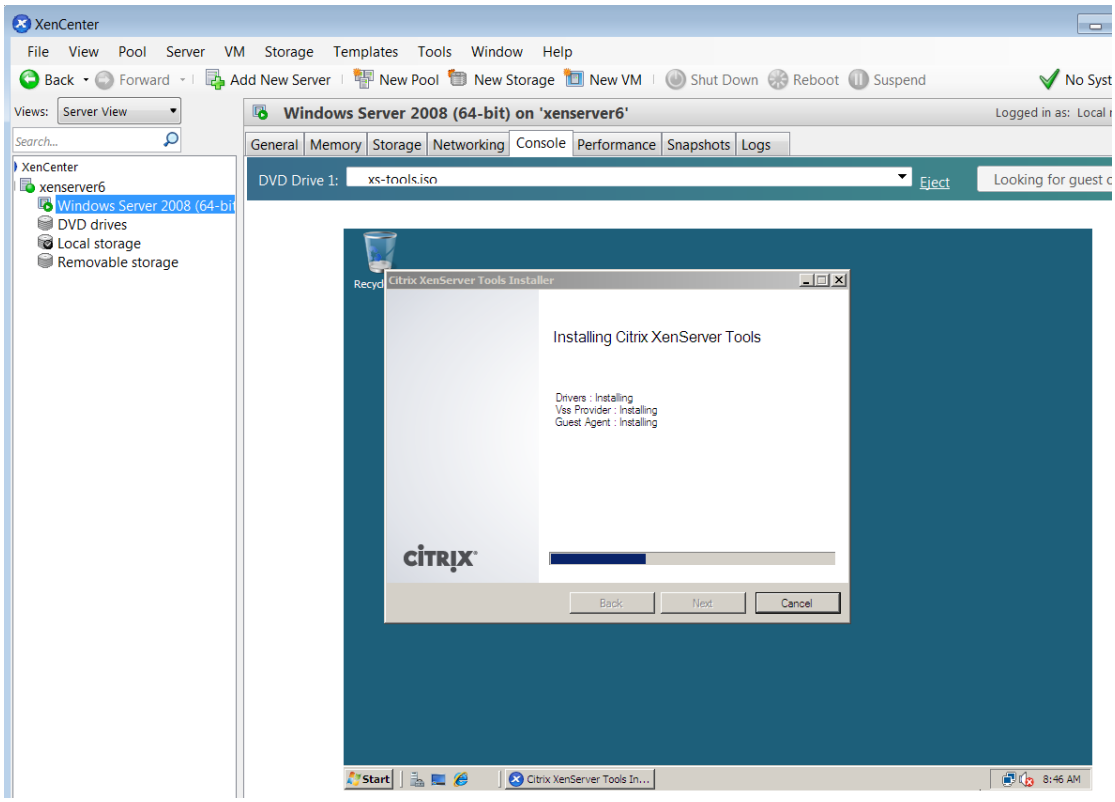
The VMs will be shut down automatically before the host shut down.（This action takes effect as default by the XenServer）



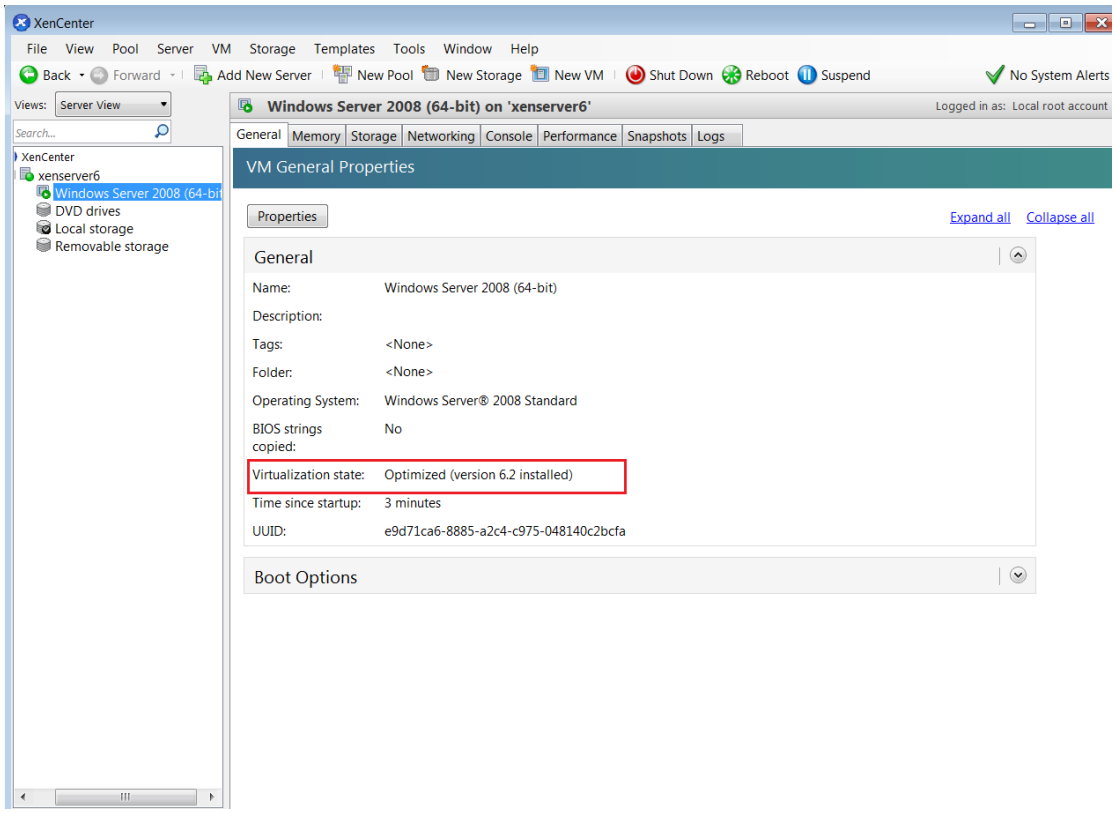
7.1 Citrix XenServer Configuration

7.1.1 Installing XenServer tools for each Virtual Machine

- Open the XenServer Client, Choose the VMs, Right click VMs, Click “Install XenServer Tools”



- The XenServer Tools is installed as below image:



7.1.2 Open XenServer host ports

- The SPS use UDP 3034 as the communication port with NMC as default.
  Note: If the UDP 3034 is captured by the other program, the value of the port will be added 1(range from 3034~3083)

- Open the XenServer Client, click the host console, Open the UDP port by the following command：
  iptables -I INPUT -p udp --dport 3034 -j ACCEPT
  iptables -I OUTPUT -p udp --dport 3034 -j ACCEPT
  /etc/rc.d/init.d/iptables save

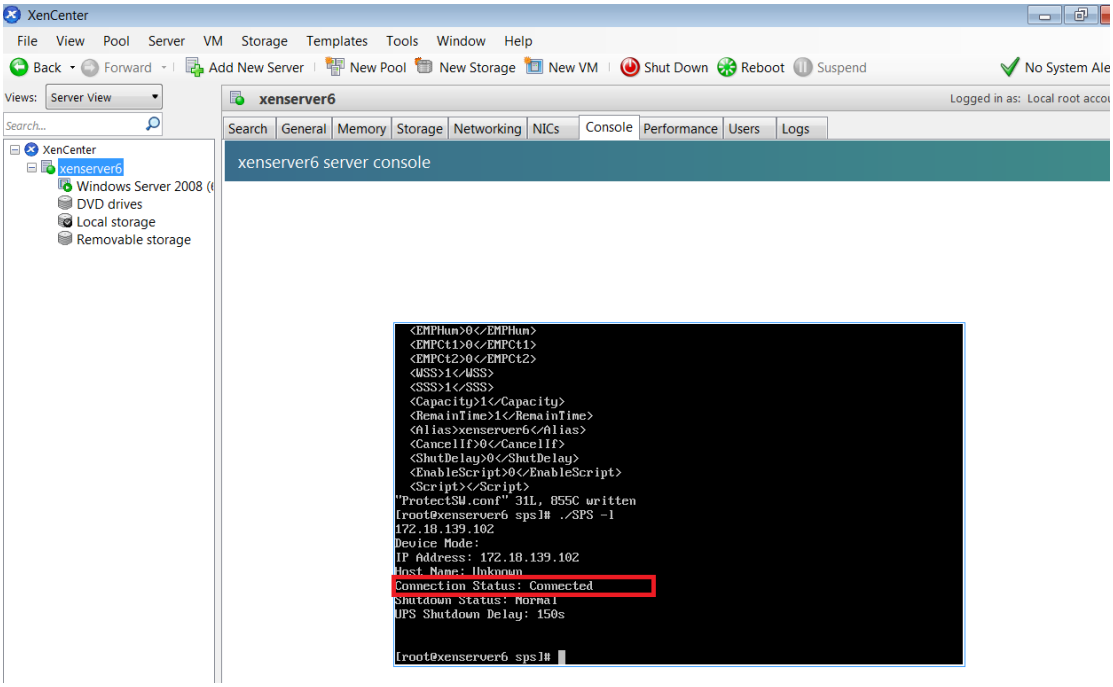
7.2 Installing and Configuring for SPS

7.2.1 Installing SPS

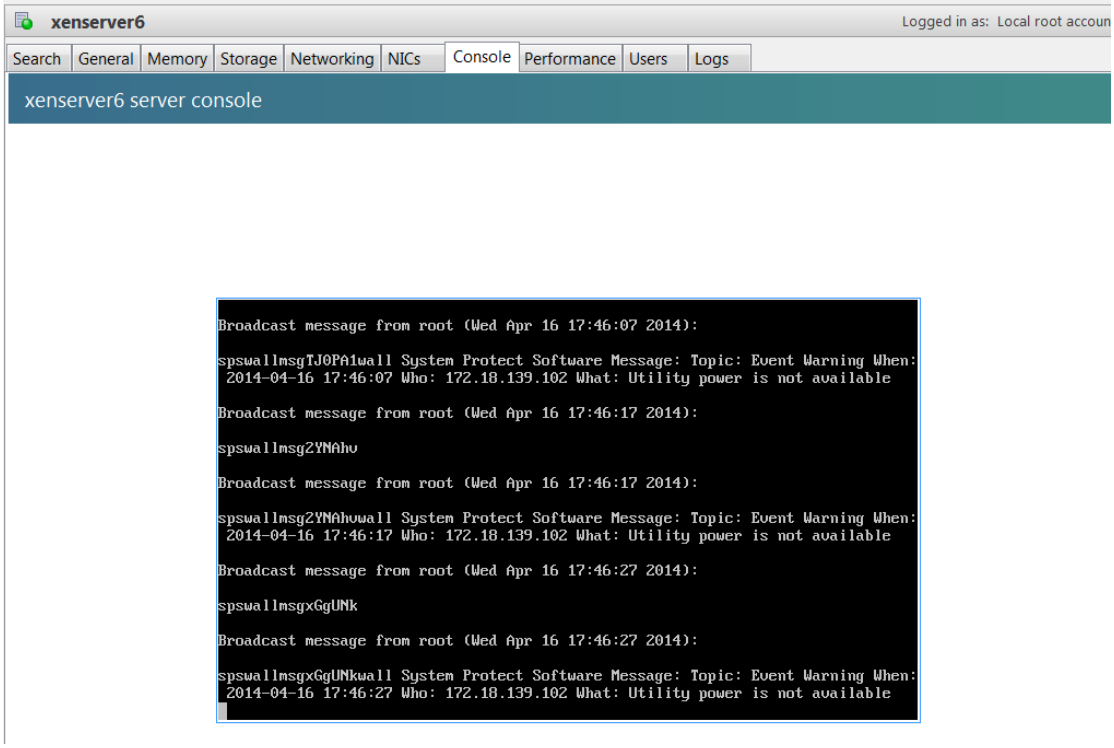
- Upload the installation file "SPS-CUI-*.*.*.*-linux-i386.tar.gz" to the XenServer host using WinSCP tools
- Unzip the installation file and install the SPS by the command
  tar –zxvf SPS-CUI-*.*.*.*-linux-i386.tar.gz
- Install the SPS by the command:
  ./SPS.install

7.2.2 Configuring SPS

- Enter the /opt/sps directory, start the SPS service by the command: **./SPSService**
- Open the configuration document by the command: **./SPS –i**
  Input the password: **admin**
  Add the NMC IP address, for example the NMC IP is "172.18.139.102"
  <RemoteList>
  <Remote name=**"172.18.139.102"** serv="2993" model=""/>
  </RemoteList>
- Please refer to chapter 3 (Linux with CUI) for more information about shutdown parameter setting
- Restart the SPS Service by the command: **./SPS –r**
- Check the NMC is connected or not by the command:
  ./SPS -l
  The NMC will be connected as below:

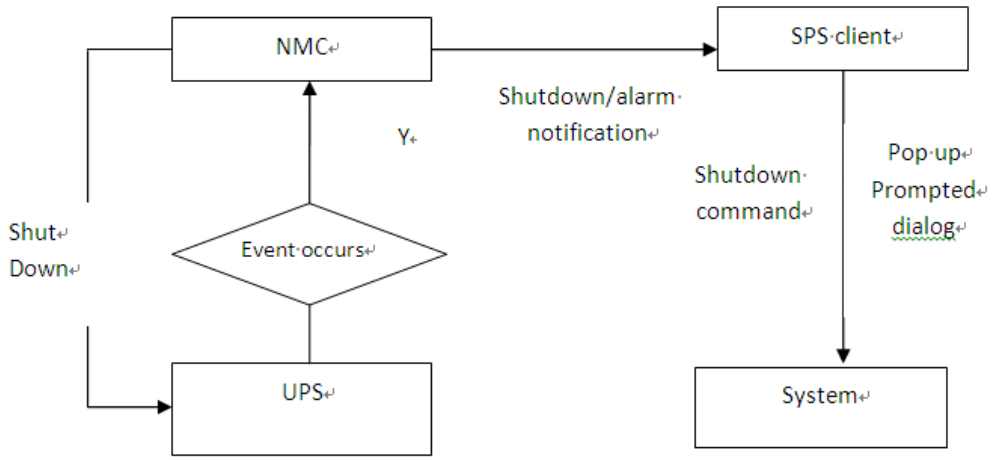


- The alarm will pop up when the AC fail as below image



8 Shutdown Operation

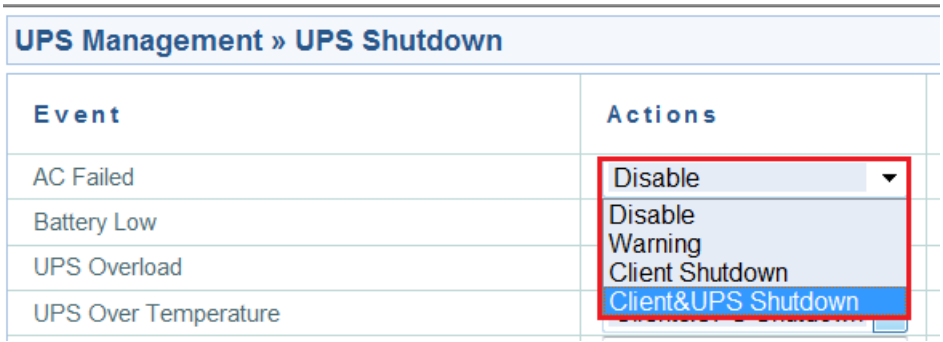
8.1 Shutdown flow chart



8.2 Shutdown setting（NMC Webpage Side）

8.2.1 Shutdown actions setting

- Open the NMC website, select UPS Management ->UPS shutdown, and check the Actions setting.



There are four definers for Actions:

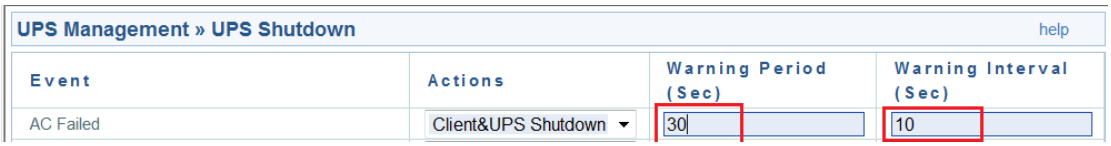
Action	Definition
Disable	The NMC will not send the alarm and shutdown notification to the SPS client, when the events occur.

Warning	The NMC will send the alarm notification to the SPS client, when the events occur.
Client Shutdown	The NMC will send the alarm and shutdown notification to the SPS client, when the events occur.
Client &UPS Shutdown	The NMC will send the alarm and shutdown notification to the SPS client when the events occur. Besides, the NMC will send the shutdown command to the UPS.

Note： Please select the action to “Client Shutdown” or “Client &UPS Shutdown”, so that the SPS client can be shut down gracefully by the NMC.

8.2.2 Warning Period and Warning Interval Setting

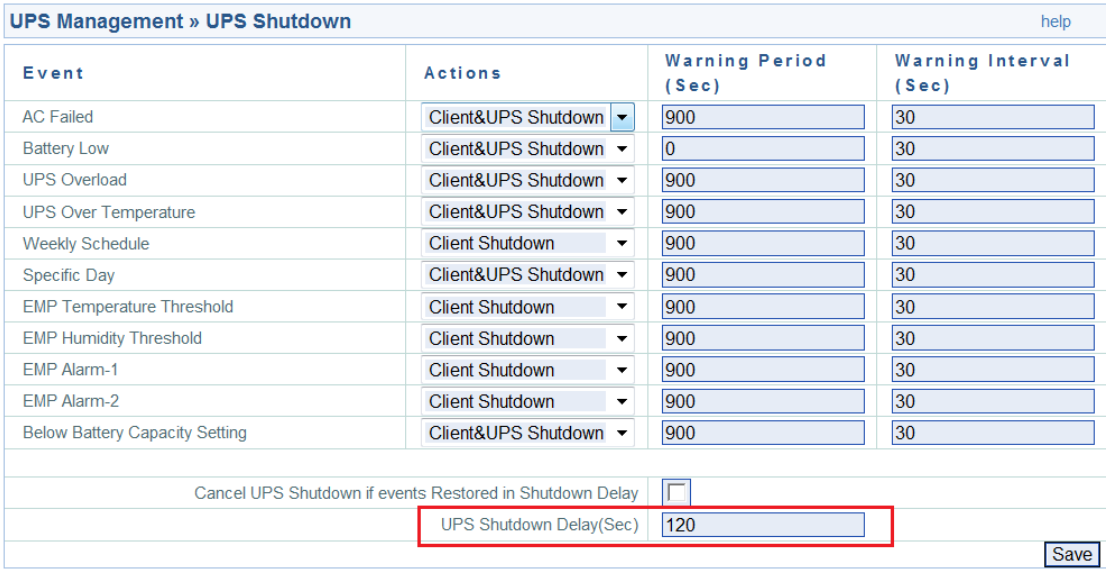
- Open the NMC website, select UPS Management ->UPS shutdown. Check the “Warning Period “setting and “Warning Interval”.



For example:
The Warning Period is set to 30S and the Warning Interval is set to 10S.
The NMC will send the “AC fail” notification to the SPS client every 10 seconds and will last about 30 seconds. The NMC will notify the SPS client to shut down after AC failing for 30S.

8.2.3 UPS Shutdown Delay Setting

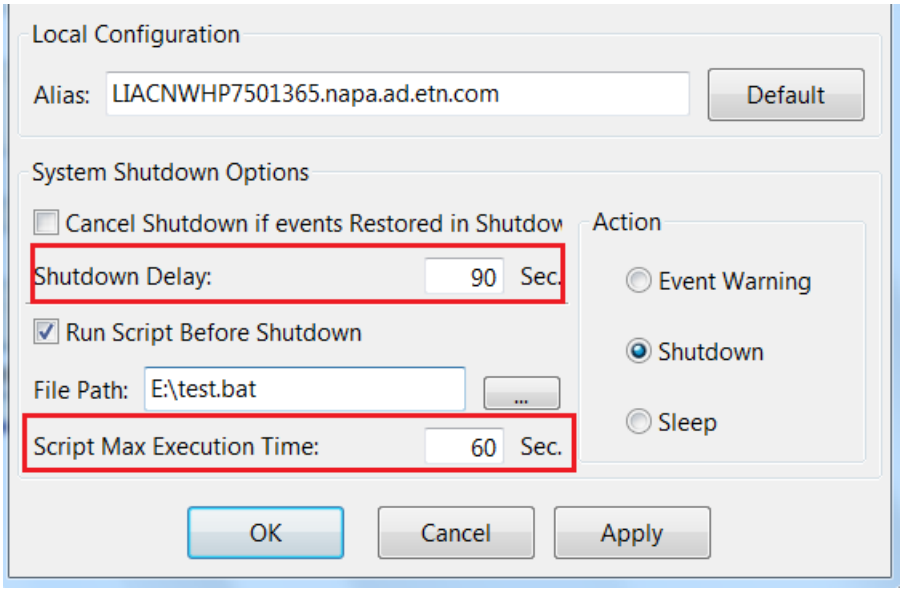
- Open the NMC website, select UPS Management ->UPS shutdown. Check the UPS Shutdown Delay setting.

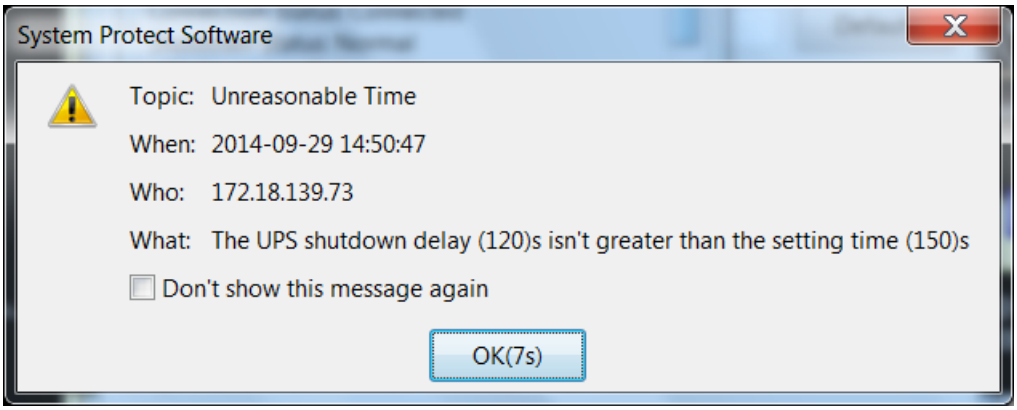


The UPS will be shut down after the “Warning Period” plus “UPS Shutdown Delay”, if the

action is “Client &UPS Shutdown”.
By the default, the UPS shutdown delay timer is 120 seconds.
For example:
AC failed Event, the “Warning Period” is 900S and the “UPS Shutdown Delay” is 120S
The UPS will be shut down after AC failing for 1020S (900S+120S).

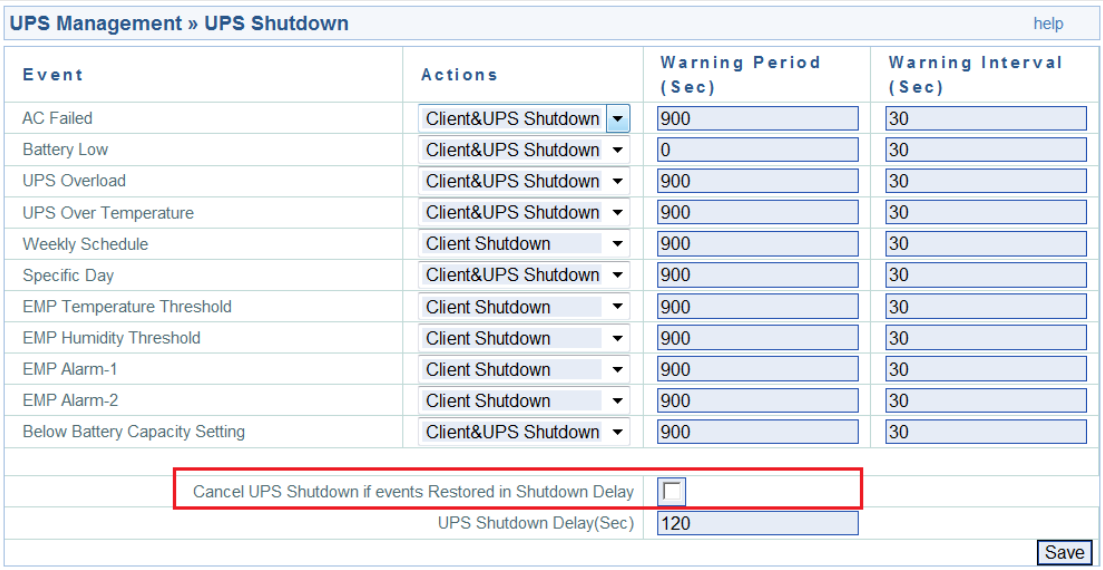
- Make sure the time for NMC “UPS Shutdown Delay” should be longer than the timer for SPS client “Shutdown delay” plus SPS “Script MAX Execution time”, or else the warning dialog will pop up that the time is unreasonable in SPS client.
  For example:
  The SPS Shutdown delay timer is 90 seconds and the Script Max Execution Time is 60 seconds. The total time value is 150seconds (90S+60S) in SPS client.
  But the UPS shutdown Delay time is 120 seconds in NMC webpage side. The UPS shutdown Delay time 120s is shorter than the 150 seconds, so the alarm dialog will pop up that the time is unreasonable.





8.2.4 Cancel UPS Shutdown if events restored in Shutdown Delay

Open the NMC website, select UPS Management ->UPS shutdown, enable/disable the checkbox for “Cancel UPS shutdown if events restored in Shutdown Delay”.



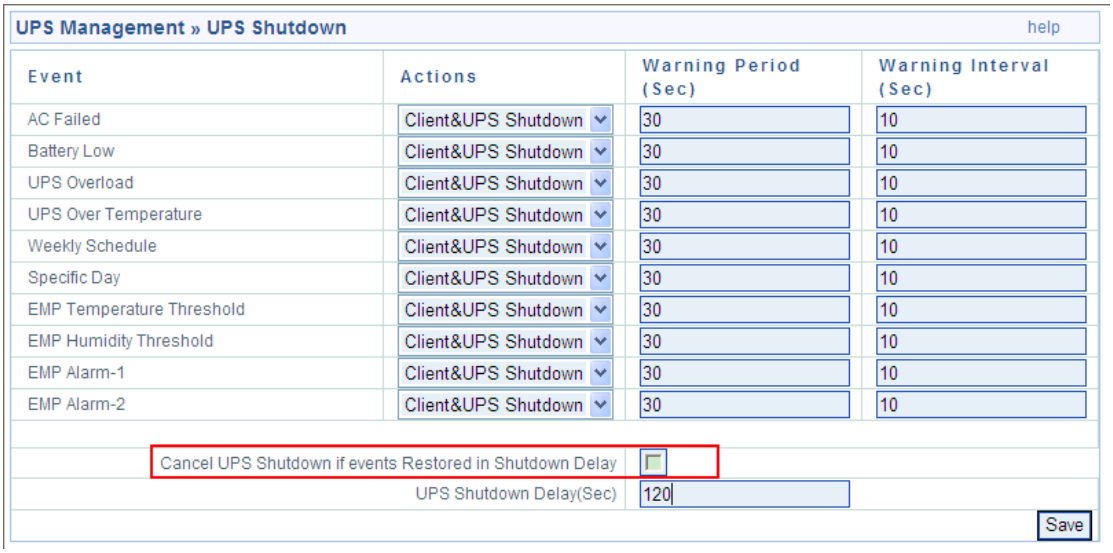
- Select the checkbox:
  If the events restore after the events occur for “Warning Period” time, the NMC will cancel the UPS shutdown command and cancel the SPS client shutdown notification
- Unselect the checkbox:
  Even If the events restore after the events occur for “Warning Period” time, the NMC still send the shutdown notification to the UPS and SPS client if the event restored during the “UPS Shutdown Delay” timer.
- For example:
  AC failed Event, the “Warning Period” is 900S and the “UPS Shutdown Delay” is 120S, select “Cancel UPS shutdown if events restored in Shutdown Delay” checkbox.
  After AC failing for 900S, then the AC restore, the NMC will cancel the UPS shutdown command and cancel the SPS client shutdown notification

8.3 Shutdown order

8.3.1 Shutdown continue if events restored

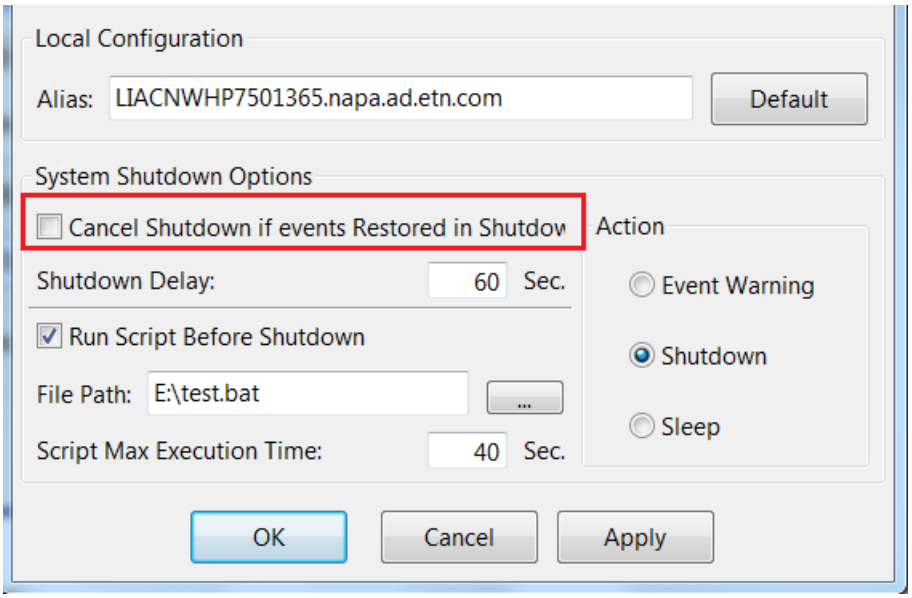
For example：

- NMC webpage side：
  Set the action to “Client &UPS Shutdown”, set the “warning period” to 30s, set the “UPS Shutdown Delay” to 120s. Unselect the “Cancel UPS shutdown if event restored” checkbox.



- SPS client side：

  Set the Shutdown Delay to 60s, set “Script Max Execution Time” to 40s, unselect “Cancel Shutdown if events restored in Shutdown Delay” checkbox.



- Shutdown order:
  1. When AC fails, the NMC send the warning to SPS client. SPS will pop up warning dialog, this process will last 30S.
  2. After AC failing for 30S, the SPS client and UPS begin to shutdown count down. After SPS client counting down for 60S, SPS begins to execute the shutdown script

     Note: Even if the AC restore during the shutdown counting down, the SPS client still continue to shut down.
  3. After executing the shutdown script for 40S, SPS client begins to shut down.
  4. After UPS counting down for 120S, the UPS begins to shut down

     Note: Even if the AC restore during the UPS counting down, the UPS still continue to shut down

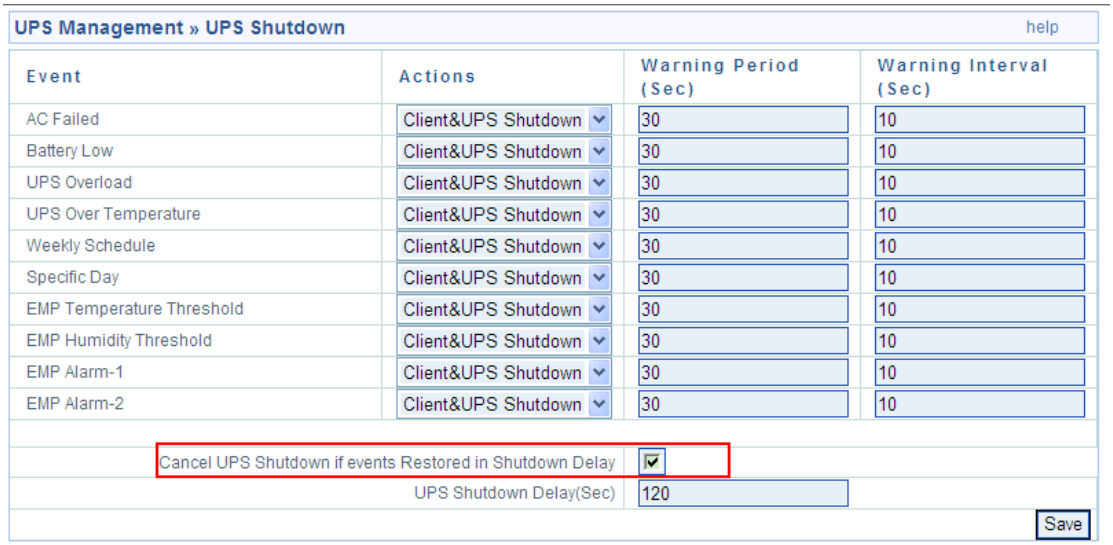
5. The system and UPS will cancel shutdown if the AC restore before AC failing for 30S.

8.3.2 Shutdown discontinue if events restored

For example：

- NMC webpage side：

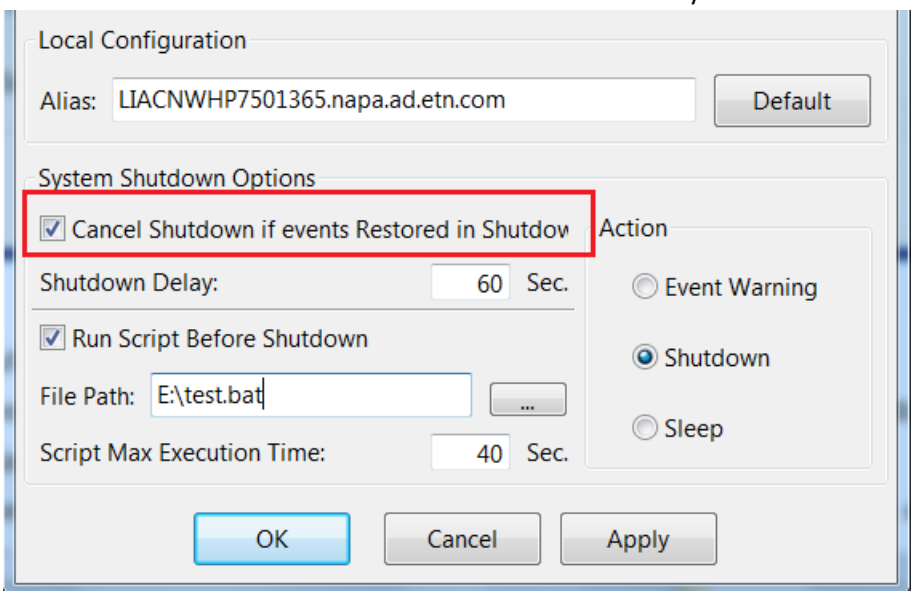
  Set the action to Client &UPS Shutdown, set the warning period to 30s, set the UPS shutdown Delay to 120s. Select the Cancel UPS shutdown if event restored checkbox.



- SPS client side：

  Set the Shutdown Delay to 60s, set Script Max Execution Time to 40s.

  Select Cancel Shutdown if events restored in Shutdown Delay.



- Shutdown order:

  1. When AC fails, the NMC send the warning to SPS client. SPS client will pop up warning dialog, this process will last 30S.
  2. After AC failing for 30S, the UPS and SPS client begin to shutdown count down. After SPS

client counting down for 60S, SPS begins to execute the shutdown script

Note: If the AC restore during the SPS client shutdown counting down, the system cancel to shut down.

3. After executing the shutdown script for 40S, SPS client begins to shut down.
4. After UPS counting down for 120S, the UPS begins to shut down

   Note: If the AC restore during the UPS counting down, the UPS will cancel to shut down
5. The SPS client and UPS will cancel shutdown if the AC restore before AC failing for 30S.

8.4 Redundant UPS Input shutdown

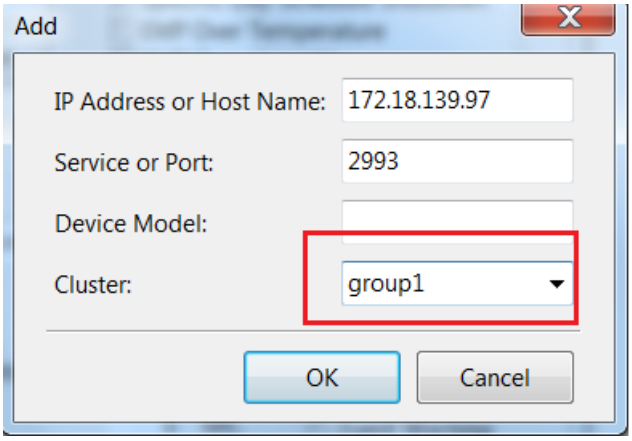
- For a computer powered by more than one NMC UPS, we can add them into a cluster.

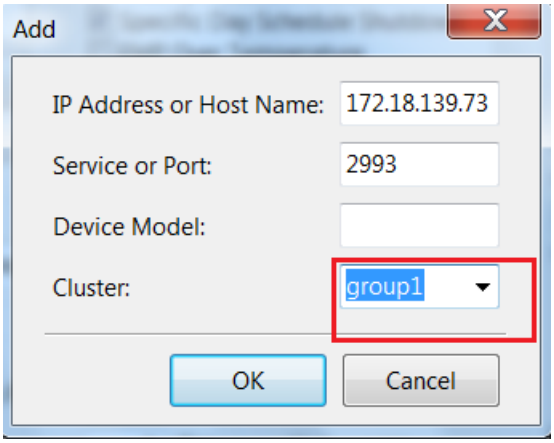
  The system will start to shut down when the shutdown conditions are all met for the devices under the group1.

  Enter the IP address of NMC via click “Add” button on the screen of SPS.

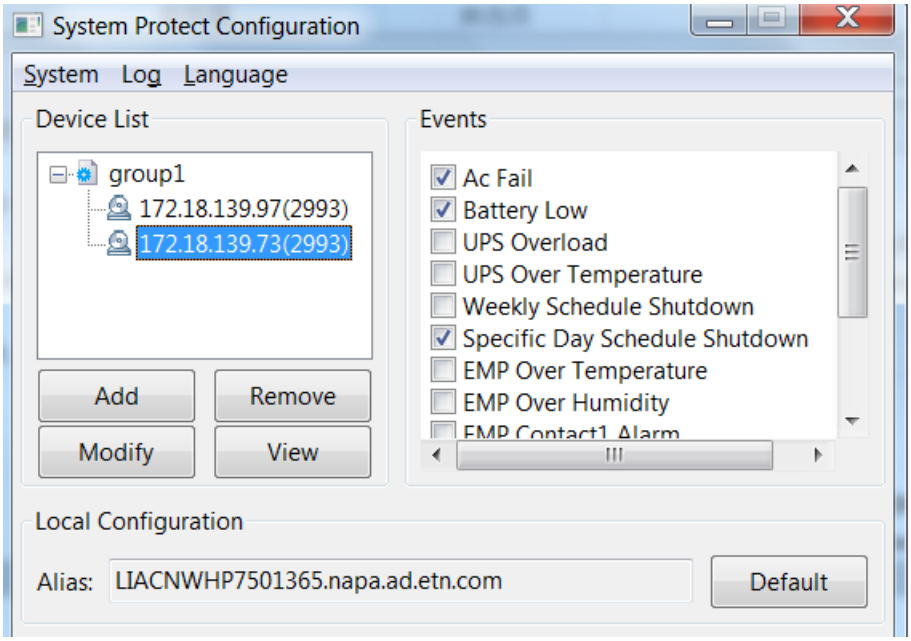
  Enter a Cluster name, for example, group1.

  Add the two NMC IP address, and enter the same Cluster name.

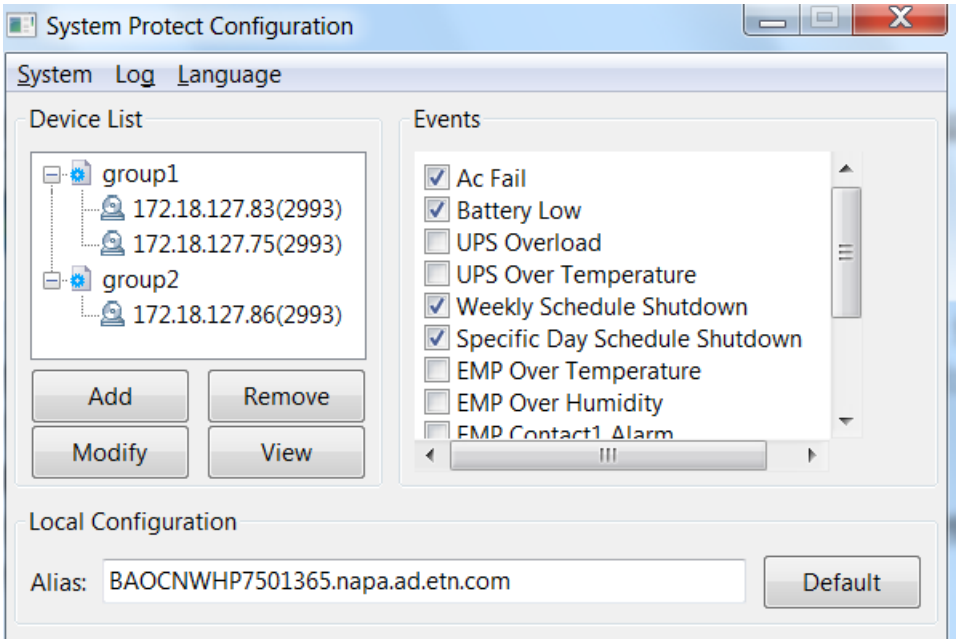




The NMC UPSs that under the same Cluster will become the same group

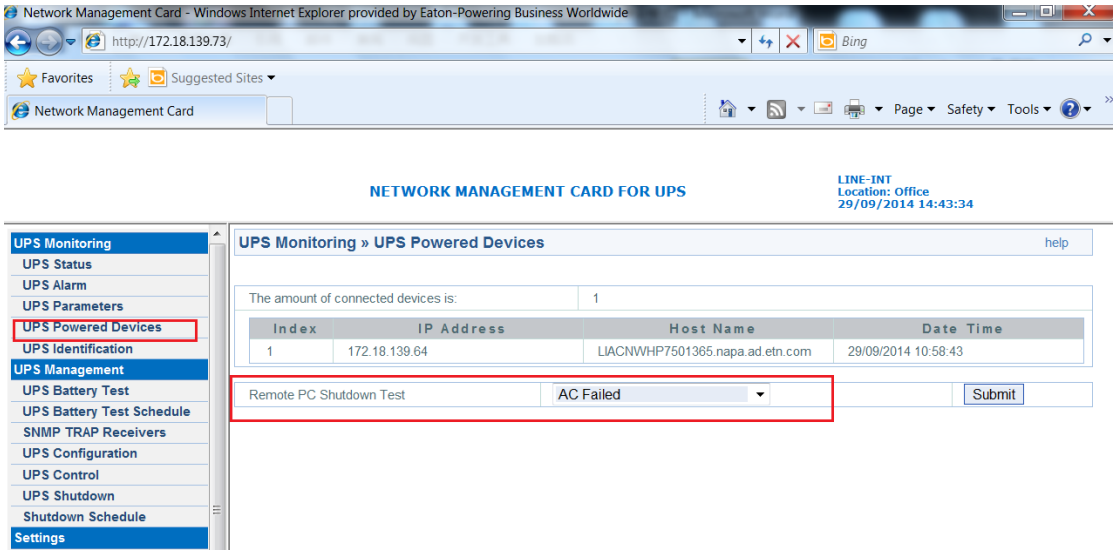


- Multi-groups are supported.
  The system will be shutdown whenever any of the group is met the shutdown condition



8.5 Simulate shutdown by event

Before doing this simulate test, please make sure the system is not running with critical mission, and is allowed to shut down for a while.
Open the NMC website, select UPS Management -> UPS Powered Devices.

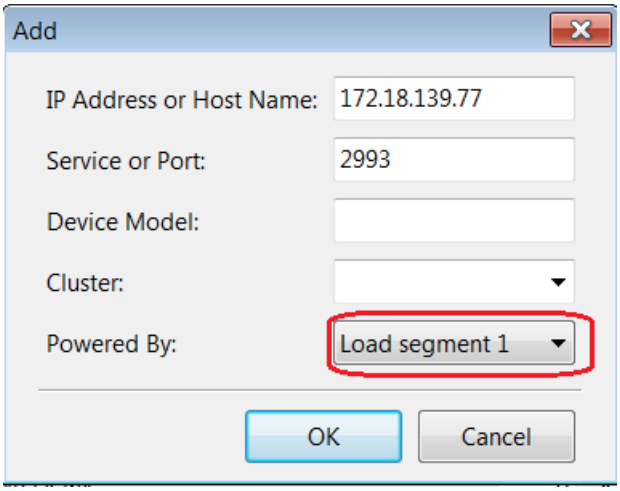


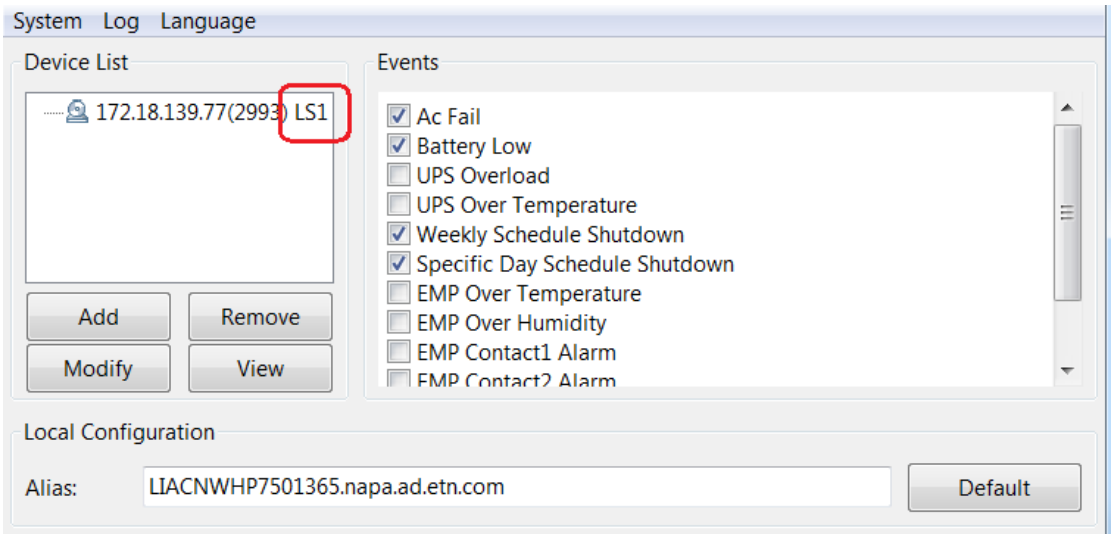
- The server for the SPS client will be added to the "UPS Powered Devices" table if the communication is established between the SPS and NMC.
- Select the event in the "Remote PC Shutdown Test" drop list, click submit button, the NMC will send the warning and shutdown notification to the SPS client.
- The SPS will show the alarms dialog and shutdown/sleep the computer.
- After the test, wait for "UPS Shutdown Delay" time (120S as default， refer to section 8.2.3), then turn on the computer system.

8.6 Load segment shutdown

Note: SPS version should be 1.5.0.2 or later

Set the "power by" parameter to Load segment 1 or Load segment 2 on the SPS client



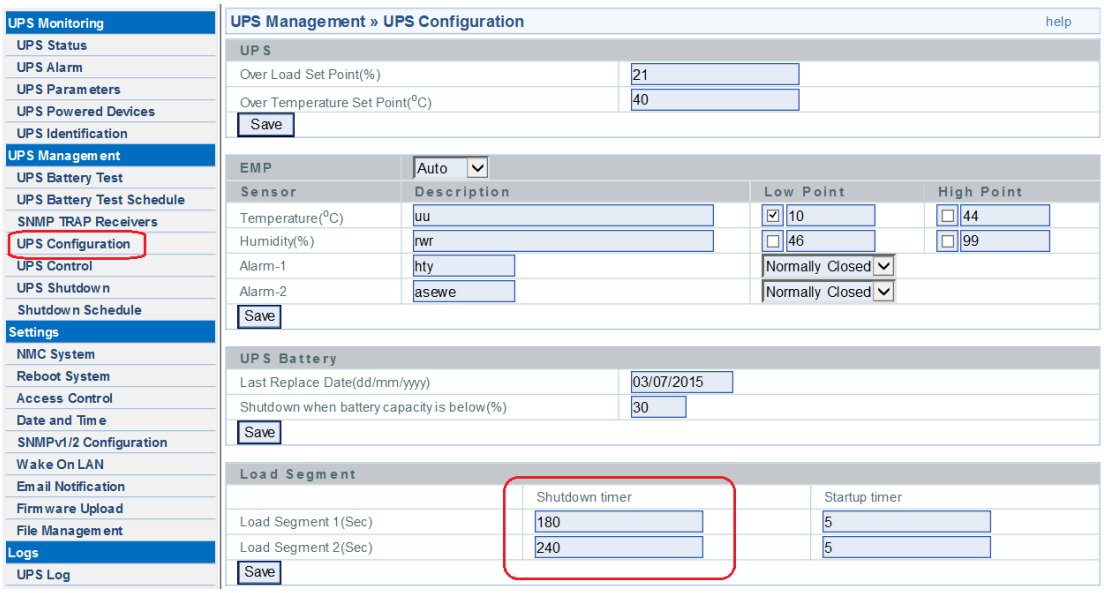


Set the Load segment shutdown timer on the NMC website

For example, the LS1 “shut down timer” is 180s and the LS2 “shut down timer” is 240s

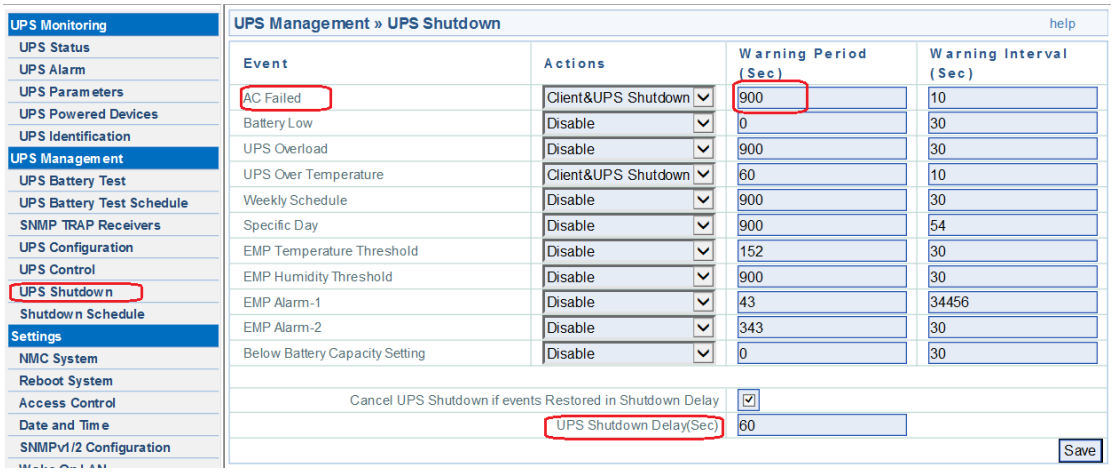
When the AC fail event occurs, the LS1 will be shut down after AC failing for 180s

When the AC fail event occurs, the LS2 will be shut down after AC failing for 240s



8.6.1 Load segment timer is shorter than AC fail warning period

- Set the UPS shutdown timer and AC failed warning period on the NMC website
  For example: The “UPS shutdown delay” timer is 60s and the AC failed “warning period” timer is 900s ,so the load segment timer is shorter than AC fail warning period. (180<900, 240<900)



- Shutdown order:

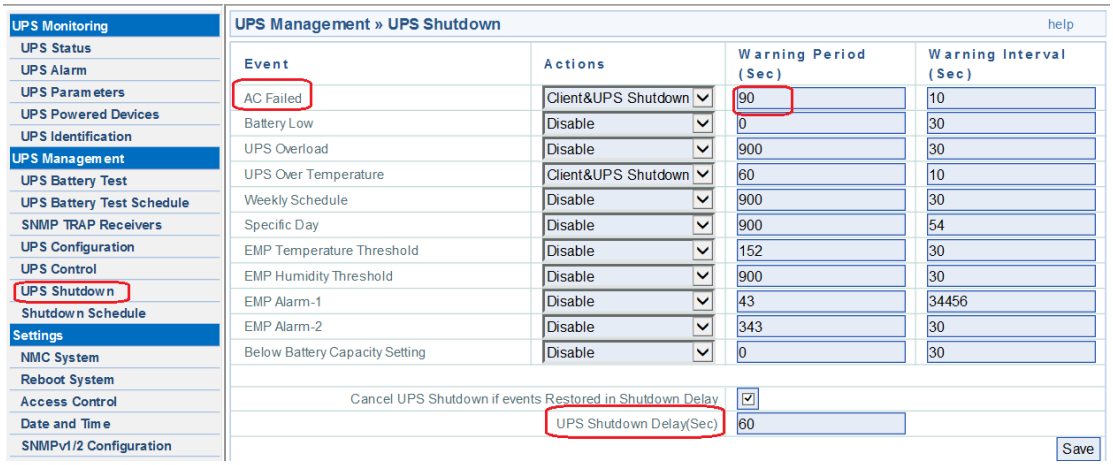
  The SPS client will be shut down after AC failing for “Load segment shutdown timer” minus “UPS shutdown Delay” timer

  1. If the system powered by LS1, the NMC will notify the SPS client to shut down after AC failing for 120s (180-60=120)
  2. If the system powered by LS2, the NMC will notify the SPS client to shut down after AC failing for 180s (240-60=180)

8.6.2 Load segment timer is longer than AC fail warning period

- Set the UPS shutdown timer and AC failed warning period on the NMC website

  For example: The “UPS shutdown delay” timer is 60s and the AC failed “warning period” is 90s ,so the load segment timer is longer than AC fail warning period(180>90, 240>90)



- Shutdown order:

  The SPS client will be shut down after AC fail “Warning Period” timer is met

  1. If the system powered by LS1(LS1 shutdown timer is longer than AC failed “warning period”, 180>90), the NMC will notify the SPS client to shut down after AC failing for 90s
  2. If the system powered by LS2(LS2 shutdown timer is longer than AC failed “warning period”, 240>90), the NMC will notify the SPS client to shut down after AC failing for 90s