IBM UPS Power Protector

Installation and Configuration for VMware ESXi 4 and ESXi 5 Virtualization Architecture

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Note: Before using this information and the product it supports, read the general information in Appendix B, “Notices,” on page 17.

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Contents

Chapter 1. Introduction

This document provides installation and configuration information for installing IBM® UPS Power Protector on VMware ESXi4 and ESXi5 platforms.

You can use UPS Power Protector to control the startup and shutdown of the virtual machines that are hosted on the same physical machine, assuring data integrity on each virtual machine.

UPS Power Protector is a solution that automates data security functions. UPS Power Protector provides the following features:

- Continuously waits for information from the management proxy or network management card that is connected to the IBM UPS.
- Warns administrators and users if the ac power fails.
- Performs a system shutdown before the end of battery backup power is reached.
- Restarts machines when the ac power restarts.

VMware ESXi does not have an administrative console therefore you cannot install UPS Power Protector on that machine. However, you can install UPS Power Protector on VMware Infrastructure Management Assistant VIMA 1.0 or on vSphere Management Assistant (vMA 4.0). Using VIMA or vMA, you can manage and shut down the VMware ESXi in case of UPS and power anomalies. You can also configure ESXi to safely suspend or shut down a guest operating system. This way you can have one UPSPower Protector shutdown agent on only one guest operating system (VIMA or vMA).

Installing the UPS Power Protector client on the VIMA or vMA instead of on each virtual machine provides the following benefits:

- Only one binary UPS Power Protector client is required on the VIMA or vMA to manage all virtual machines.
- Dynamic management of virtual machine configuration with a personalized script.

The UPS Power Protector client is supported on a VMware virtualization server with two guest operating systems (Windows Server 2003 R2 and Red Hat 5.4) for electrical power events, shutdown, low battery, and reboot.

For more information about installing and using UPS Power Protector, see the *IBM UPS Power Protector User's Guide* at http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPPWIN.

Notices and statements in this document

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
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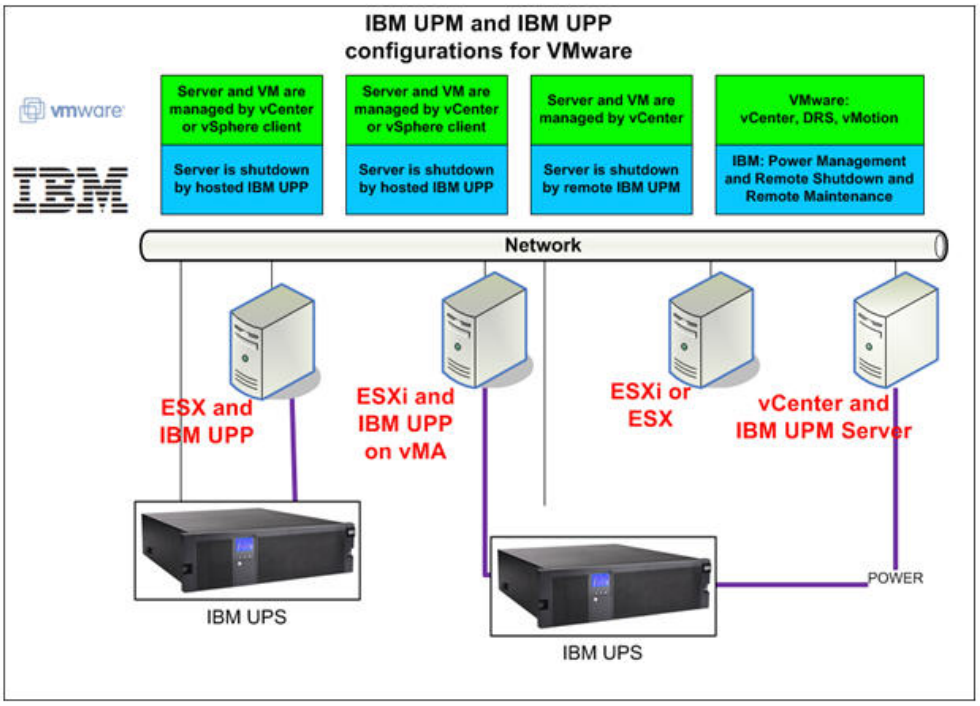
Chapter 2. IBM offering for VMware

IBM provides three solutions for VMware that are shown in the following architecture diagram.



- The first solution provides ESX server graceful shutdown. UPS Power Protector is installed on each ESX operating system.

  Use this solution when:

  – vCenter Server is not available for management of hosts.

  – Number of ESX is limited.

  For more information, see the *IBM UPS Power Protector Installation and Configuration Guide for VMware ESX 4.0 and ESX 4.1 Virtual Architecture*.
- The second solution provides ESXi server graceful shutdown (paid ESXi version only). The free version cannot be shut down because of VMware restrictions. UPS Power Protector is installed on a VIMA/vMA (one instance of UPS Power Protector per ESXi).

  Use this solution when:

  – vCenter Server is not available for the management of hosts.

  – Number of ESX is limited.
- The third solution is for multiple ESX and ESXi servers (paid version only). It provides the following features:

  – Remote graceful shutdown of multiple ESX/ESXi servers and hosted VMs

  – ESX/ESXi remote maintenance (vMotion)

  – An UPS Power Manager plug-in is created in vCenter

  – UPS events are accessible through vCenter

Chapter 3. Installing UPS Power Protector on VIMA or vMA

This chapter provides information about installing and configuring UPS Power Protector on VIMA or vMA.

Prerequisites

The following is a list of prerequisites:

- The VMware ESXi server machine is up and running.
- Only the ESXi paid version is supported by this integration process.
- VMware Infrastructure Management Assistant VIMA 1.0 or vSphere Management Assistant (vMA 4.0 or 5.0) is installed as a guest operating system.
- vSphere client is installed on a different machine than the VMware ESXi server configuration.
- UPS Power Protector package.
- SSH client for installation and configuration.
- SCP Client to upload packages to VIMA or vMA.
- VMware tools installed on each virtual machine.

Notes:

1. Through the network connection, the IBM UPSs are compatible with UPS Power Protector on ESXi.
2. Through the RS232/USB connection, VIMA and vMA are not compatible with UPS Power Protector.

Installing VIMA or vMA

To download and install VIMA or vMA on ESXi host machines, see http://www.vmware.com/support/developer/vima/.

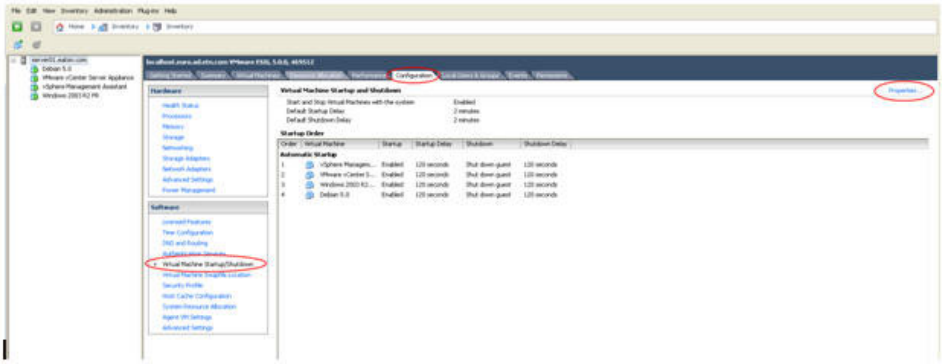
Configuring VMware ESXi

- You must configure the physical machine to allow automatic operating system boot on startup. This setting is in your machine BIOS. For more information, see the specific technical hardware documentation.
- To allow interactions between physical and virtual machines, VMware tools have to be installed on each virtual machine. For more information, see the VMware ESXi Server documentation.
- You can configure the automatic startup and shutdown properties of guest operating systems. For UPS Power Protector to work correctly, configure VIMA or vMA with the following settings:
  - Automatic shutdown of VIMA or vMA when an ESXi host is shutting down.
  - Automatic startup of VIMA or vMA when an ESXi host is starting.

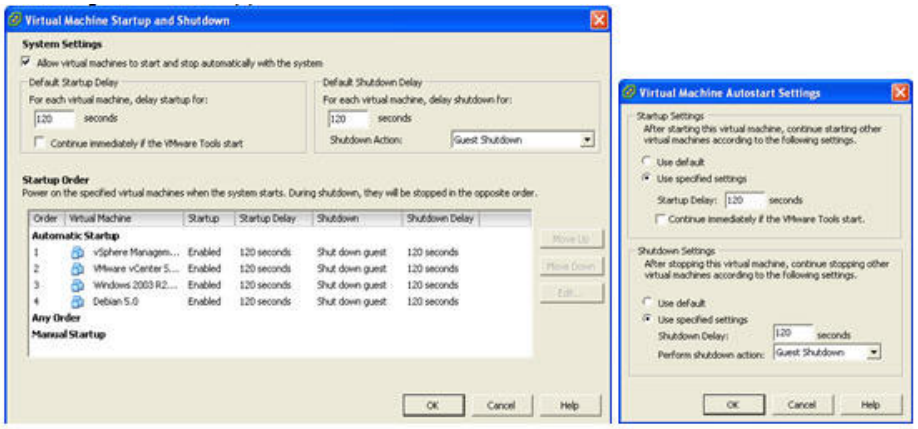
To configure the VIMA or vMA shutdown and startup properties, complete the following steps:

1. From the Virtual Infrastructure Client interface, select **ESXi host server** from the left navigation tree.
2. Select the **Configuration** tab.

3. Select **Virtual machine startup/shutdown → Properties** present in the right corner.



The following window opens.



4. Select the VIMA or vMA guest machine and click **Edit**. Use the following configuration as shown in the previous illustration:
   - Startup Settings:

     Select **Use specified settings**.

     Startup Delay: 120 seconds
   - Shutdown Settings:

     Select **Use specified settings**.

     Shutdown Delay: 120 seconds

To configure the automatic virtual machine boot of other guest machines on VMware ESXi start-up, complete the following steps:

1. From the Virtual Infrastructure Client interface, go to the **Virtual machine startup/shutdown** menu.
2. Select **Configuration→Properties→Start and stop VMs with the system**.
3. Choose **Enable**.

Note: On the Properties page, you can also define the startup order of your virtual machines:

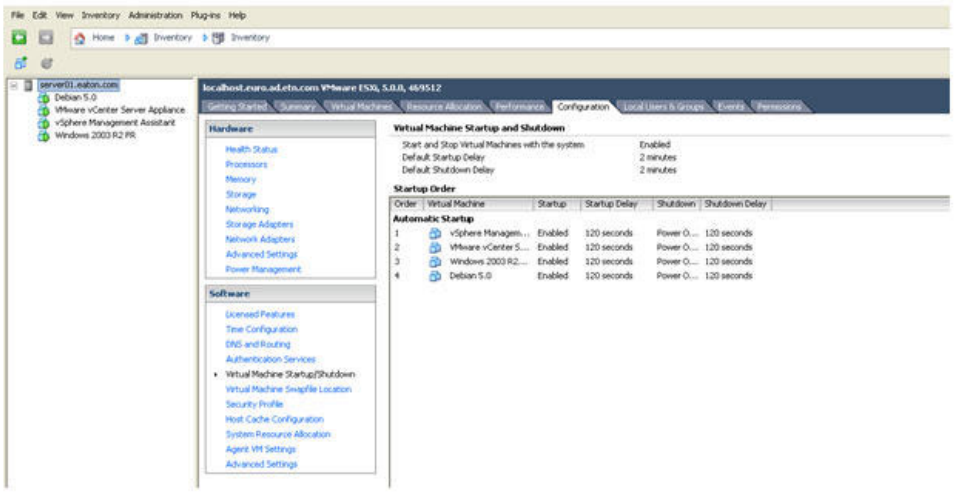
Start and Stop VMs with the system: Enabled

Default Startup Delay: x Seconds

Default Shutdown Delay: x Seconds

Startup Order: Automatic Startup

This configuration is shown in the following figure:



Hardware architecture

The prerequisites for UPS Power Protector installation are described in the *IBM UPS Power Protector User's Guide*, which you can downloaded at:

http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPPWIN.

For UPS systems compatibility, see the "Compatibility list" section.

Network architecture

All hardware elements must have an operational network configuration that enables them to communicate with each other.

Note: vMA5 (Suse operating system) does not need a firewall setting. Proceed to the next section.

Make sure that the vMA firewall authorizes the following:

- Connections on TCP ports 4679 and 4680 to enable remote access for supervision and configuration through a web browser. These ports are reserved at IANA http://www.iana.org.

- Connections through TCP port 80. TCP port 80 must be opened as a destination port (for output) on the machine hosting UPS Power Protector.

To enable communication between UPS Power Protector and the network management card, type the following commands:

```
sudo iptables -I OUTPUT -p tcp --dport   80 -j ACCEPT
sudo iptables -I OUTPUT -p tcp --dport 5000 -j ACCEPT
sudo iptables -I INPUT  -p tcp --dport 4679 -j ACCEPT
sudo iptables -I INPUT  -p tcp --dport 4680 -j ACCEPT
sudo iptables -I INPUT  -p udp --dport 4679 -j ACCEPT
sudo iptables -I INPUT  -p udp --dport 4680 -j ACCEPT
```

Enter the following command to save firewall settings:

```
service iptables save
```

To configure your VMware ESXi Server for the network, see the *IBM UPS Power Protector User's Guide*.

Installing UPS Power Protector on a VMware ESXi server

To install UPS Power Protector on a VMware server complete the following steps:

1. Go to http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPPLNX and download the software package for your Linux operating system.
2. Upload the package on your VIMA/vMA environment with an SCP client.
3. Connect with SSH to the vMA. Make sure that you have the correct authority to run and install programs on VIMA or vMA. For more information, see the VMware documentation.

   Note: If you are not the root user, when you start the installer you will receive the following error:

   ```
   error: can't create transaction lock
   ```

   Enter `sudo -s` to get a root console and run the installer again.
4. Install IBM UPS Power Protector by typing:

   ```
   [vma ~]$ rpm -i upp-linux-xx.xx.xxxx-1.x86_64.rpm
   ```

   To configure a personalized package, see the *IBM UPS Power Protector User's Guide*.
5. Connect to UPS Power Protector using your web browser by typing:

   ```
   http://<@IP-or-name-of-vMA>:4679/  (for HTTP access)
   https://<@ IP-or-name-of-vMA>:4680/  (for HTTPS access)
   ```

Chapter 4. Using UPS Power Protector with VMware ESXi

After the UPS Power Protector installation, follow the three steps described in the following sections to use UPS Power Protector or see the *IBM UPS Power Protector User's Guide*.

Step 1 (remote access)

1. From a remote machine, type one of the following URLs in a web browser:

   ```
   https://<name or IP address of vMA hosting UPP>:4680/
   http://<name or IP address of vMA hosting UPP>:4679/
   ```

2. In SSL mode, accept the certificate by clicking **Yes**.
3. Enter `USERID` as the **Login**, `passw0rd` as **Password** and click **Login**.

Step 2 (configuration)

The following are the two types of scans that can be performed:

- Quick scan: The Quick scan discovers networked UPSs through broadcast within a few seconds (network management cards). The discovered UPS connected through a network are not automatically assigned as the power source. You have to select the node and click **Set as Power Source**. The icon becomes green

  
  .

  The discovered nodes are displayed by selecting **Settings → Auto Discovery**. For the other nodes, perform the discovery based on IP address ranges (Range scan).

  Note: When started, the application automatically performs a Quick scan.

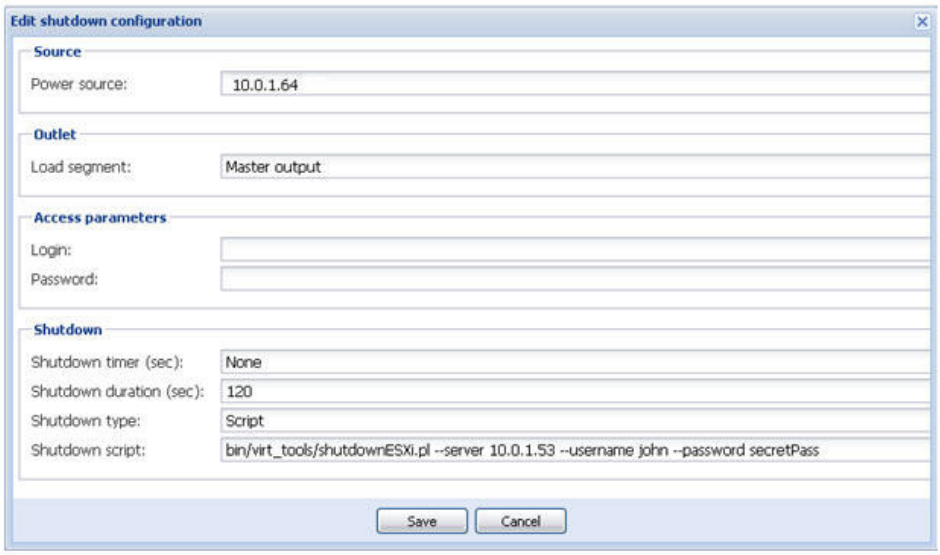
- Range scan: The Range scan operation discovers the nodes that are outside of the network segment and nodes that are not compatible with the Quick scan feature. On the **Settings → Shutdown** page, assign the IP address of the UPS that powers the local computer. In the **Settings → User List** page, assign the access rights through login and password.

  Edit the shutdown configuration. Use the Shutdown type (Script) and in the field **Shutdown script** enter the following command:

  ```
  perl bin/virt_tools/shutdownESXi.pl --server @ServerIP/Name
  --username Server_username--password Server_Password
  ```

Modify the following parameters with the correct information for your environment:

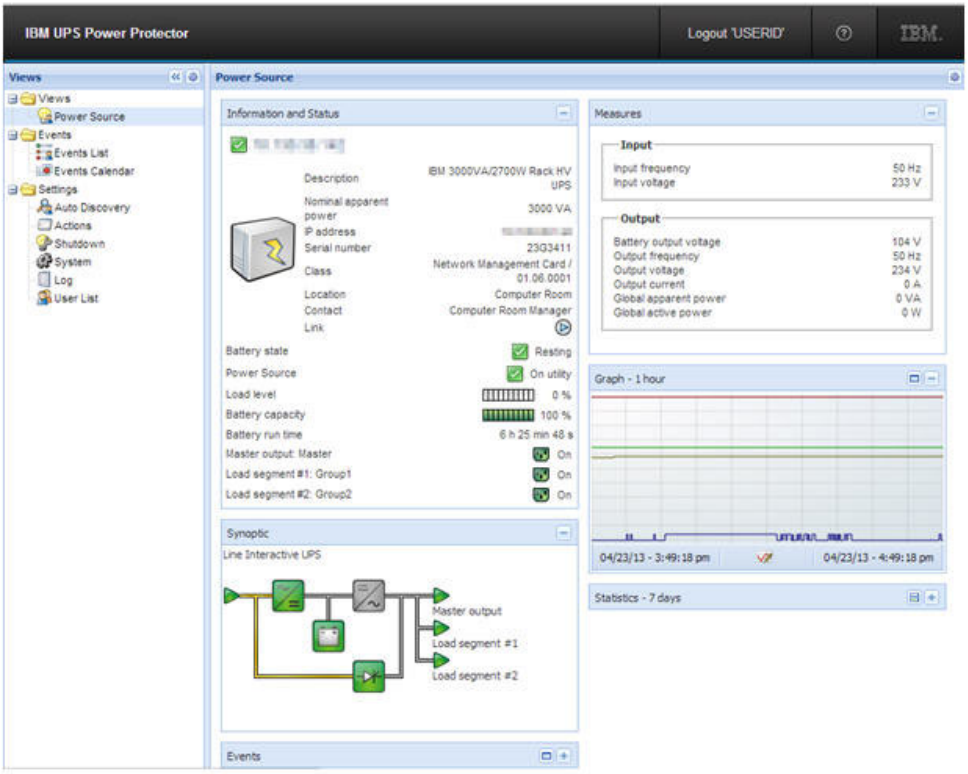
– @ServerIP/Name: IP of the ESXi Server (such as, 10.1.0.250)
– Server_username: Name of an Administrator user of the ESXi Server
– Server_Password: Password of the administrator user.



Step 3 (operation)

Click **Views → Power Source** to monitor the current state of the UPS that powers the server that is running UPS Power Protector.

Click **Events → Event List** to view the device events.



Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. Use this information to obtain additional information about IBM and IBM products, determine what to do if you experience a problem with your IBM system or optional device, and determine whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

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- Check the power switches to make sure that the system and any optional devices are turned on.
- Check for updated firmware and operating-system device drivers for your IBM product. The IBM Warranty terms and conditions state that you, the owner of the IBM product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your IBM service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
- If you have installed new hardware or software in your environment, check http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/ to make sure that the hardware and software is supported by your IBM product.
- Go to http://www.ibm.com/supportportal/ to check for information to help you solve the problem.
- Gather the following information to provide to IBM Support. This data will help IBM Support quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.
  - Hardware and Software Maintenance agreement contract numbers, if applicable
  - Machine type number (IBM 4-digit machine identifier)
  - Model number
  - Serial number
  - Current system UEFI and firmware levels
  - Other pertinent information such as error messages and logs
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- **Standard upload with the system serial number:** http://www.ecurep.ibm.com/app/upload_hw
- **Secure upload:** http://www.ibm.com/de/support/ecurep/send_http.html#secure
- **Secure upload with the system serial number:** https://www.ecurep.ibm.com/app/upload_hw

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Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

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When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

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