IBM UPS Power Protector

Installation and Configuration Guide for Xen 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 1
Notices and statements in this document 2

Chapter 2. Citrix Xen 3
Configuring a Citrix XenServer 3
Prerequisites to install UPS Power Protector on a Citrix XenServer 5.6 x86 computer 4
Hardware architecture 4
Network architecture 4
Installing UPS Power Protector 5

Chapter 3. Xen on RHEL 5 and Debian 5.0 (Lenny) 7
Xen Domain0 configuration 7
Prerequisites to install UPS Power Protector on Xen enabled on RHEL 5 /Debian 5.0 (Lenny) 8
Hardware Architecture 8
Network architecture 8
Installing UPS Power Protector 8

Chapter 4. Using UPS Power Protector 11
Step 1 (access) 11
Step 2 (configuration) 11
Step 3 (operation) 12

Appendix A. Getting help and technical assistance 13
Before you call 13
Using the documentation 14
Getting help and information from the World Wide Web 14
How to send Dynamic System Analysis data to IBM 14
Creating a personalized support web page 14
Software service and support 14
Hardware service and support 15
IBM Taiwan product service 15

Appendix B. Notices 17
Trademarks 17
Important notes 18

Index 19

Chapter 1. Introduction

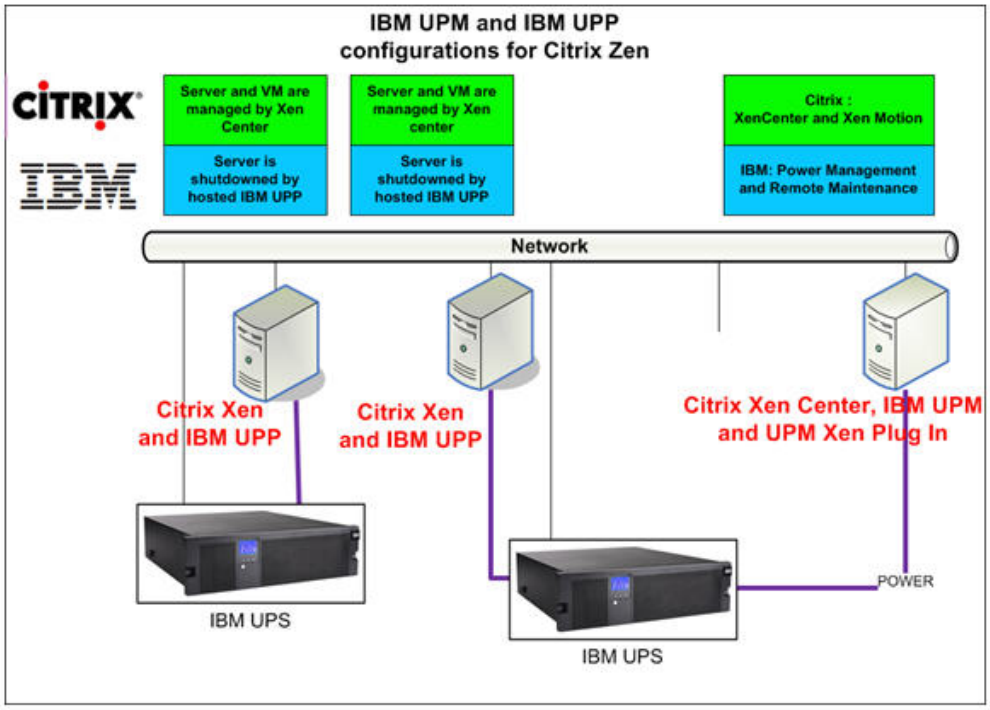
This document provides installation and configuration information for installing IBM® UPS Power Protector on the following Xen virtualization environments:

- Citrix XenServer 5.6,
- OpenSource Xen 2.6 on Red Hat Enterprise Linux 5
- OpenSource Xen 3.2 on Debian 5.0 (Lenny)

UPS Power Protector discovers and monitors IBM UPSs that are connected across a network through an IBM Network Management Card or a proxy. It monitors the remote servers that are hosting the UPS Power Protector. It also provides local computer graceful shutdown. The IBM UPS Power Protector interface can be accessed remotely by using a web browser.

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.

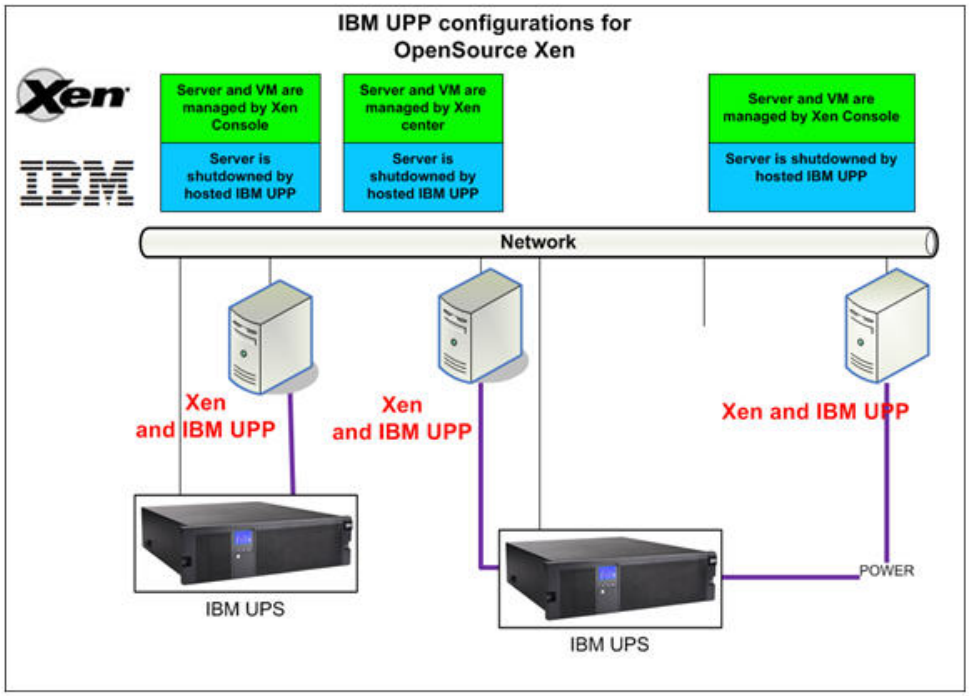
IBM provides two solutions for Citrix Xen that are illustrated in the following architecture diagram.



- The first solution provides graceful shutdown for Citrix Xen. UPS Power Protector is installed on each Citrix Xen system. This solution does not require Xen Center management software.
- The second solution is for multiple Xen servers. It provides the following features:
  - Xen server remote maintenance to trigger VM Xen Motion
  - Xen server remote shutdown

    Use this solution for larger infrastructures that are working through a Xen Center. For more information, see the *IBM UPS Power Manager User's Guide*.

The OpenSource Xen solution that is illustrated in the following architecture diagram provides graceful shutdown for Xen. UPS Power Protector is installed on each Xen system. This solution does not require Xen Center management software.



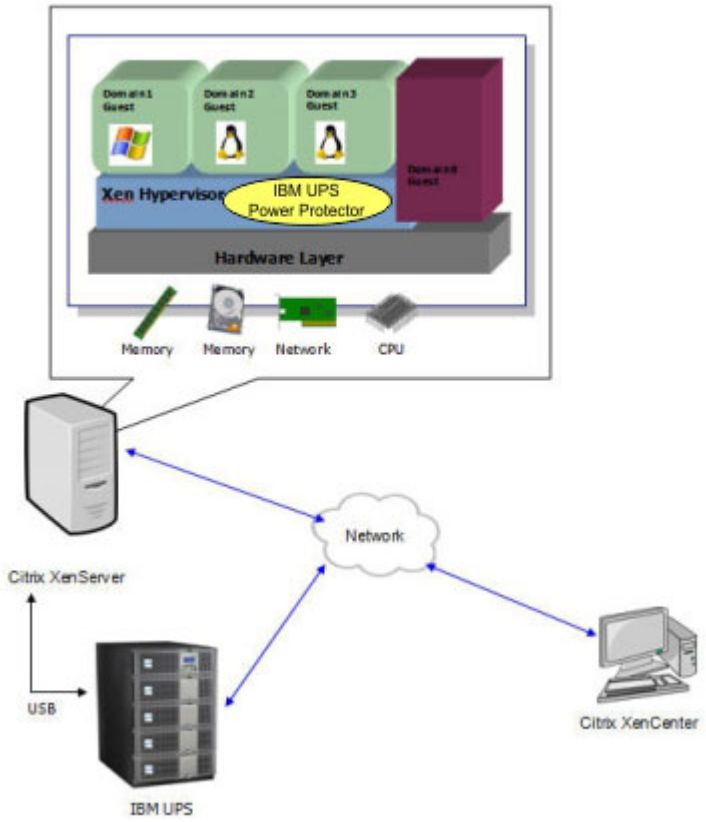
Notices and statements in this document

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage might occur.

Chapter 2. Citrix Xen

The following illustration shows the Citric XenServer architecture.

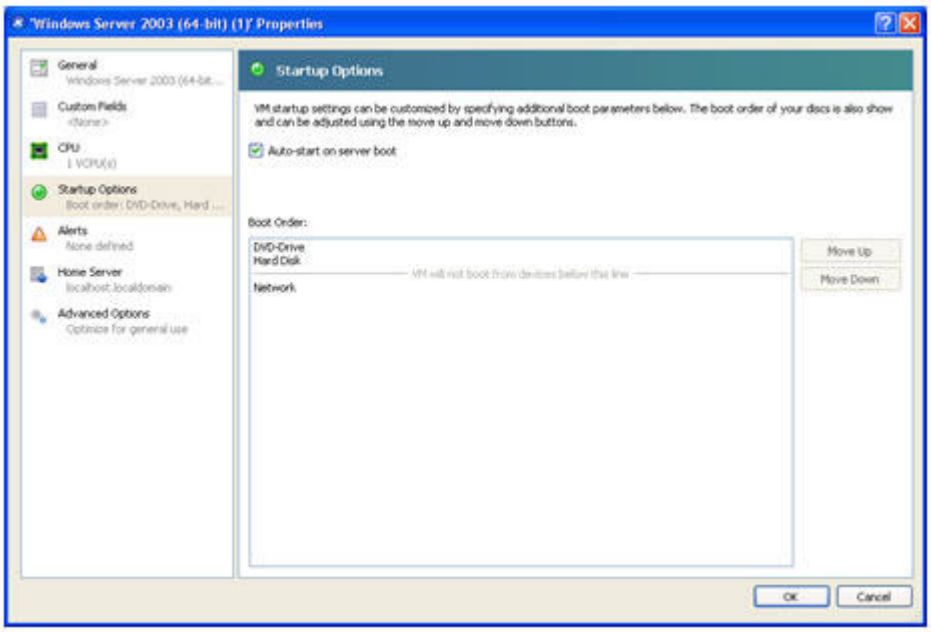


Configuring a Citrix XenServer

Before you install UPS Power Protector on a Citrix XenServer host, perform the following configuration tasks:

- Hardware support for virtualization must be enabled on the host. This is an option in the BIOS. It is possible your BIOS might have virtualization support disabled. Consult your BIOS documentation for more details.
- For automatic operating system boot on startup, you must configure the physical machine to do the same. This setting is present in the BIOS. For further information, see specific technical hardware documentation.
- In XenServer, to allow virtual machines to function correctly, install PV Tools (XenTools) should be installed on each virtual machine. For more information, see the applicable XenServer Installation guide.

XenCenter is an administrative console that monitors and manages XenServer hosts and guest machines. To make every virtual machine start automatically, select the check box in XenCenter for the option **Allow virtual machines to start and stop automatically with the system** (located in properties of every virtual machine).



Prerequisites to install UPS Power Protector on a Citrix XenServer 5.6 x86 computer

The following prerequisites are required to install UPS Power Protector on a Citrix XenServer 5.6 x86 computer:

- XenServer host with 5 MB free space
- IBM UPS Power Protector installation packages on a XenServer

Notes:

1. Make sure that XenServer and XenCenter are the same version. For compatibility issues, see the *XenServer Installation Guide*.
2. To allow a graceful shutdown of the Virtual machines, you have to install PV Tools (XenTools) on each virtual machine.
3. In case of resource pools, if the subordinate computer goes down, the master computer will continue functioning. But if the master computer is shut down, all the guest computers in that pool will go down and the pool will not function until the master is rebooted.

Hardware architecture

For more information about the installation prerequisites and system compatibility, see the “Installation prerequisites” section in the *IBM UPS Power Protector User's Guide*. For the UPS system compatibility, see the “Compatibility list” section.

Network architecture

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

Make sure that the following TCP/UDP ports are enabled on XenSever firewall:

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

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

The following shows the configuration to enable communication between UPS Power Protector and an IBM Network Management Card.

```
iptables -I OUTPUT -p tcp --dport   80 -j ACCEPT
iptables -I INPUT -p tcp --dport 4679 -j ACCEPT
iptables -I INPUT  -p tcp --dport 4680 -j ACCEPT
iptables -I INPUT  -p udp --dport 4679 -j ACCEPT
iptables -I INPUT  -p udp --dport 4680 -j ACCEPT
iptables -I OUTPUT  -p udp --dport 4679 -j ACCEPT
iptables -I OUTPUT  -p udp --dport 4680 -j ACCEPT
service iptables save
iptables-save
```

Installing UPS Power Protector

To install the latest version of UPS Power Protector for Linux, complete the following steps.

Note: During the installation of this package on the host, it will automatically detect the Linux server.

1. Go to http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPPLNX and download the software package for the Linux operating system.
2. Upload the Linux package on your Xen environment.
3. To install an UPS Power Protector rpm package on the XenServer, issue the following command:

   ```
   rpm -i upp-linux-xx.xx.xxxx-1.i386.rpm
   ```

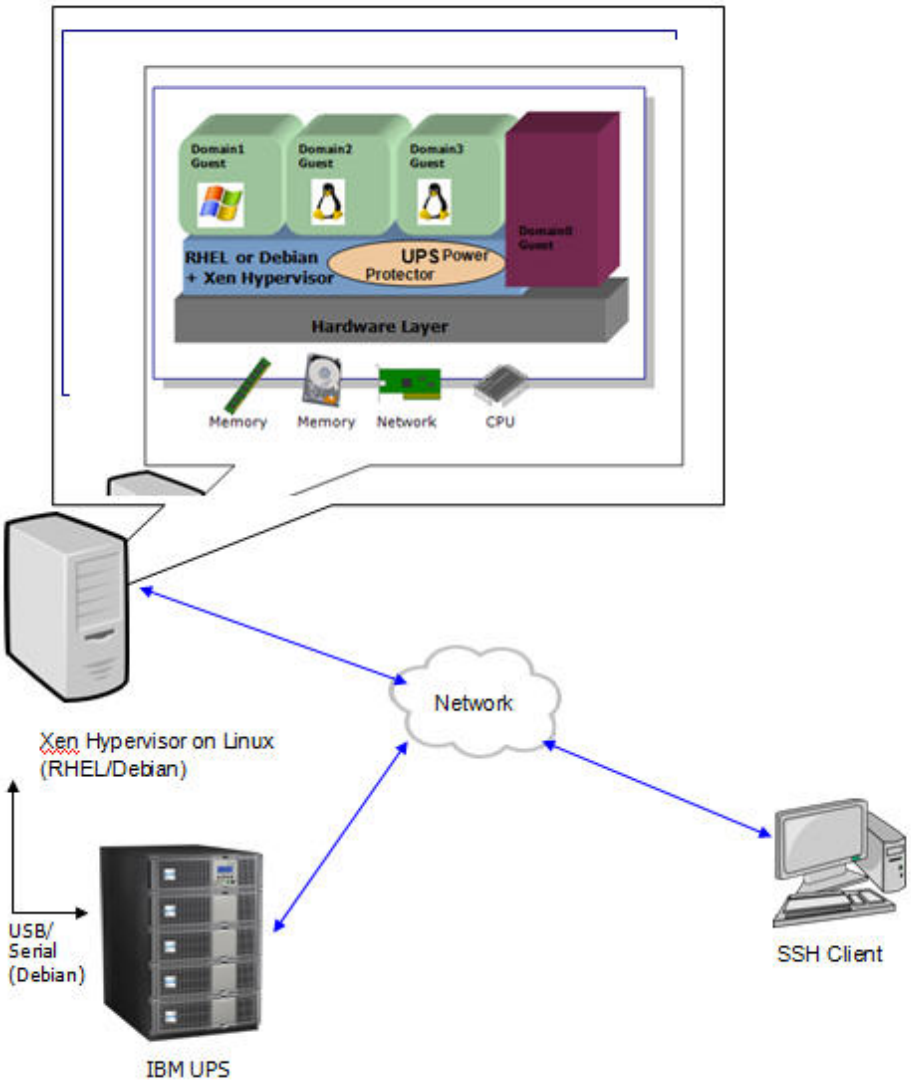
   For the silent installation process, see the *IBM UPS Power Protector User's Guide*.
4. Connect to UPS Power Protector using your web browser by typing one of the following web addresses:

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

The UPS Protector interface is displayed. For more information, see *IBM UPS Power Protector User's Guide*.

Chapter 3. Xen on RHEL 5 and Debian 5.0 (Lenny)

The following illustration shows the Xen architecture on Red Hat Enterprise Linux 5 and Debian 5.0.



Xen Domain0 configuration

Before installing UPS Power Protector on RHEL/Debian Lenny where Xen Domain0 is enabled, perform the following configuration tasks:

- Hardware support for virtualization must be enabled on the host. This is an option in the BIOS. It is possible your BIOS might have virtualization support disabled. Consult your BIOS documentation for more details.
- For automatic operating system boot on startup, you must configure the physical machine to do the same. This setting is present in BIOS. For further information, see specific technical hardware documentation.
- To enable Windows virtual machines to function correctly, GPL Para virtualized (PV) drivers must be installed on each Windows virtual machine.

Prerequisites to install UPS Power Protector on Xen enabled on RHEL 5 /Debian 5.0 (Lenny)

The following are the prerequisites to install UPS Power Protector on Xen enabled on RHEL 5/Debian 5.0 (Lenny):

- Xen hypervisor (on RHEL/Debian) that has a minimum of 5 MB of free space
- IBM UPS Power Protector installation packages on RHEL/Debian.

Notes:

1. To enable a graceful shutdown of guest virtual machines, you have to install GPL PV drivers on each virtual machine.
2. UPSs through RS232 connectivity are not supported on RHEL5 because the serial ports are used by Xen.

Hardware Architecture

For more information about the installation prerequisites and system compatibility, see the “Installation prerequisites” section in the *IBM UPS Power Protector User's Guide*. For the UPS system compatibility, see the “Compatibility list” section.

Network architecture

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

Make sure that the following TCP/UDP ports are enabled on XenServer/Xen hypervisor firewall:

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

To configure communication between UPS Power Protector and an IBM Network Management Card, type the following commands:

```
iptables -I OUTPUT -p tcp --dport   80 -j ACCEPT
iptables -I INPUT -p tcp --dport 4679 -j ACCEPT
iptables -I INPUT  -p tcp --dport 4680 -j ACCEPT
iptables -I INPUT  -p udp --dport 4679 -j ACCEPT
iptables -I INPUT  -p udp --dport 4680 -j ACCEPT
iptables -I OUTPUT  -p udp --dport 4679 -j ACCEPT
iptables -I OUTPUT  -p udp --dport 4680 -j ACCEPT
service iptables save
iptables-save
```

Installing UPS Power Protector

To install the latest version of UPS Power Protector for Linux, complete the following steps.

Note: During the installation of this package on the host, the Linux server is automatically detected.

1. Go to http://www.ibm.com/support/entry/portal/docdisplay?lndocid=EATN-UPPLNX and download the software package for either the RHEL 5 or Debian Lenny operating system.
2. Upload the Linux package on your Xen environment.

3. To install the UPS Power Protector rpm package on the XenServer, issue one of the following commands:

   For Red Hat Enterprise Linux:

   ```
   rpm -i upp-linux-xx.xx.xxxx-1.i386.rpm
   ```

   For Debian:

   ```
   dpkg -i upp-linux_xx.xx.xxxx-1_i386.deb
   ```

   For the silent installation process, see the *IBM UPS Power Protector User's Guide*.

4. Connect to UPS Power Protector using your web browser by typing one of the following web addresses:

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

Make sure that the permission to run the Xen shutdown script is enabled in the System Settings.

Chapter 4. Using UPS Power Protector

After the UPS Power Protector installation, complete the steps in this chapter to use UPS Power Protector. For more information about UPS Power Protector, see the *IBM UPS Power Protector User's Guide*.

Step 1 (access)

Remote access (for XenServer)

From a remote machine, you can type one of the following URLs in a web browser:

- https://*<name or IP address of the server hosting IBM UPP>*:4680/
- https://*<name or IP address of the server hosting IBM UPP>*:4679/

In SSL mode, accept the certificate by clicking **Yes**.

Enter `USERID` for the Login field and `passw0rd` in the Password field. Click **Login**.

Step 2 (configuration)

When started, the application automatically performs a Quick scan. The Quick scan operation discovers the following devices:

- Serial line connected UPSs (RS232 or USB)

  The discovered UPS connected through (RS232 or USB) is automatically assigned as the power source. (The Status icon becomes green .)
- Networked UPSs through broadcast within a few seconds (network management cards)

  The discovered UPSs 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 Status 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).

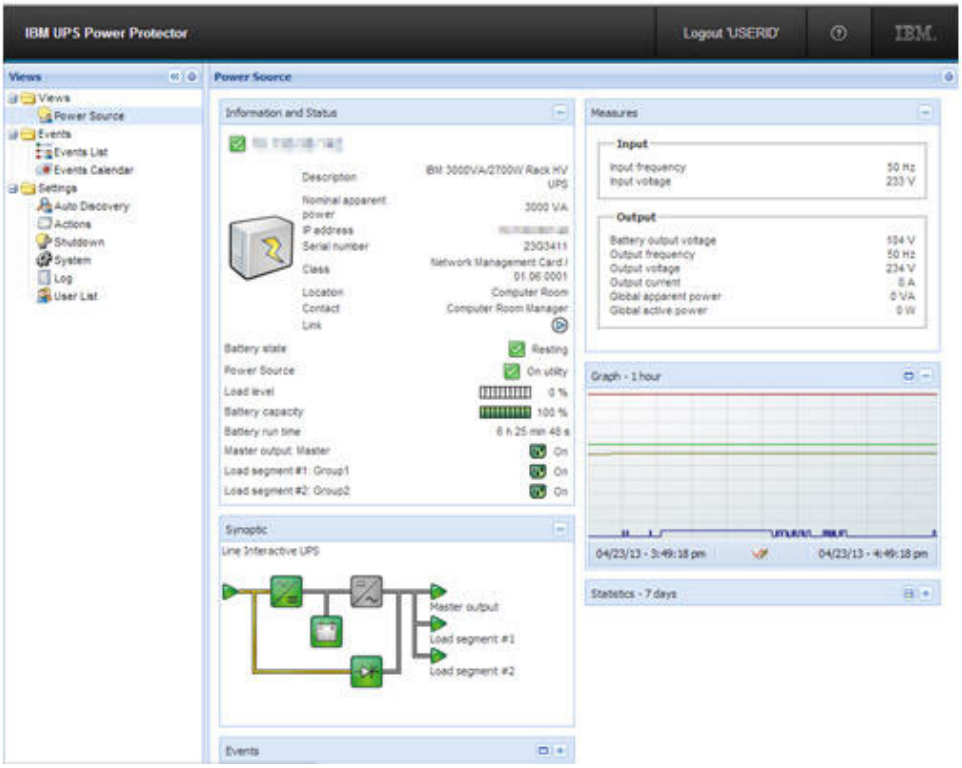
- Using the Range Scan operation you will discover the nodes that are outside of the network segment and nodes that are not compatible with the Quick scan feature.

  Select **Settings → Shutdown** to assign the IP address of the UPS that powers the local computer. With UPS Power Protector the standard shutdown feature now integrates Xen shutdown. For more information about shutdown settings, see the *IBM UPS Power Protector User's Guide*.
- Select **Settings → User List** and assign the access rights through the login and password.

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:

- Check all cables to make sure that they are connected.
- 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
- Go to http://www.ibm.com/support/entry/portal/Open_service_request/ to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to IBM Support quickly and efficiently. IBM service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that

contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/supportportal/. Also, some documents are available through the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

Getting help and information from the World Wide Web

On the World Wide Web, up-to-date information about IBM systems, optional devices, services, and support is available at http://www.ibm.com/supportportal/. The address for IBM System x® information is http://www.ibm.com/systems/x/. The address for IBM BladeCenter® information is http://www.ibm.com/systems/bladecenter/. The address for IBM IntelliStation® information is http://www.ibm.com/systems/intellistation/.

How to send Dynamic System Analysis data to IBM

Use the IBM Enhanced Customer Data Repository to send diagnostic data to IBM. Before you send diagnostic data to IBM, read the terms of use at http://www.ibm.com/de/support/ecurep/terms.html.

You can use any of the following methods to send diagnostic data to IBM:

- **Standard upload:** http://www.ibm.com/de/support/ecurep/send_http.html
- **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

Creating a personalized support web page

At http://www.ibm.com/support/mynotifications/, you can create a personalized support web page by identifying IBM products that are of interest to you. From this personalized page, you can subscribe to weekly email notifications about new technical documents, search for information and downloads, and access various administrative services.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with your IBM products. For information about which products are supported by Support Line in your country or region, see http://www.ibm.com/services/supline/products/.

For more information about Support Line and other IBM services, see http://www.ibm.com/services/, or see http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to http://www.ibm.com/partnerworld/ and click **Find Business Partners** on the right side of the page. For IBM support telephone numbers, see http://www.ibm.com/planetwide/. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

IBM Taiwan product service

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台灣國際商業機器股份有限公司
台北市松仁路 7 號 3 樓
電話：0800-016-888

IBM Taiwan product service contact information:
IBM Taiwan Corporation
3F, No 7, Song Ren Rd.
Taipei, Taiwan
Telephone: 0800-016-888

Appendix B. Notices

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UNIX is a registered trademark of The Open Group in the United States and other countries.

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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.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

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.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory might require replacement of the standard memory with an optional memory module.

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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Index

A
assistance, getting 13
attention notices 2

C
Citric XenServer architecture 3

D
diagnostic data 14
Dynamic System Analysis 14

G
getting help 13

H
hardware service and support 15
help, getting 13

I
IBM Support Line 14
important notices 2

N
notes 2
notes, important 18
notices 17
notices and statements 2

S
software service and support 14
statements and notices 2

T
telephone numbers 15
trademarks 17

U
using UPS Power Protector 11

W
website
  personalized support 14
  publication ordering 14
  support line, telephone numbers 15

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