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Installing and configuring
Intelligent Power® Protector
on KVM Virtualized Architecture

KVM 0.12.1.2 on RHEL 6

KVM 0.12.1.2 on Debian 5.0(Lenny)



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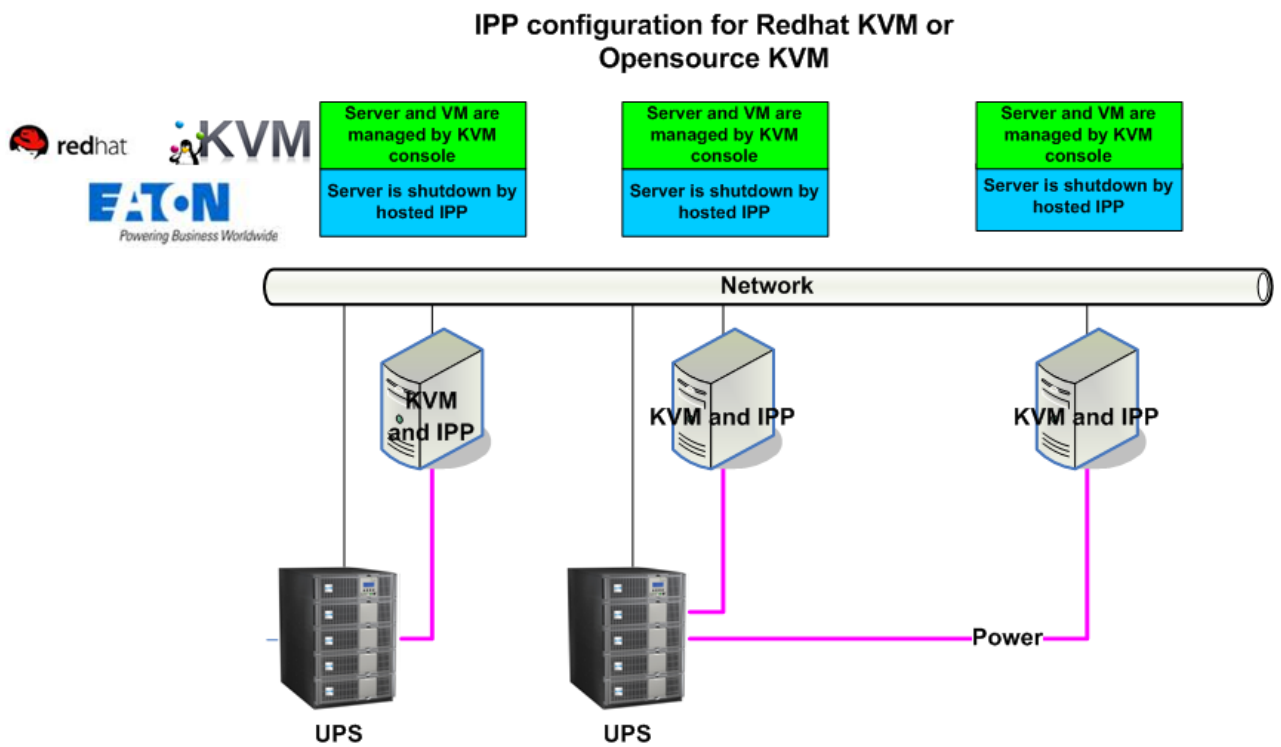
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Introduction

Kernel-based Virtual Machine (KVM) is an open source technology that provides a full solution for virtualization on Linux (please refer to <http://www.linux-kvm.org> for more details)

Eaton's Intelligent Power® Protector (IPP) discovers and supervises Eaton's UPSs connected across a network either by means of a card or proxy. It also provides local computer graceful shutdown. The IPP interface can be accessed remotely using a web browser.

Our objective is to provide a virtualization support for Eaton's power protection software – Intelligent Power® Protector. The purpose of this document is to understand the installation and configuration of IPP on KVM virtualization environment.



Eaton provides following solution for Redhat KVM and Open source KVM that is illustrated on the previous architecture diagram:
It provides graceful shutdown for KVM. IPP is installed on each KVM system.

(Refer to this manual).



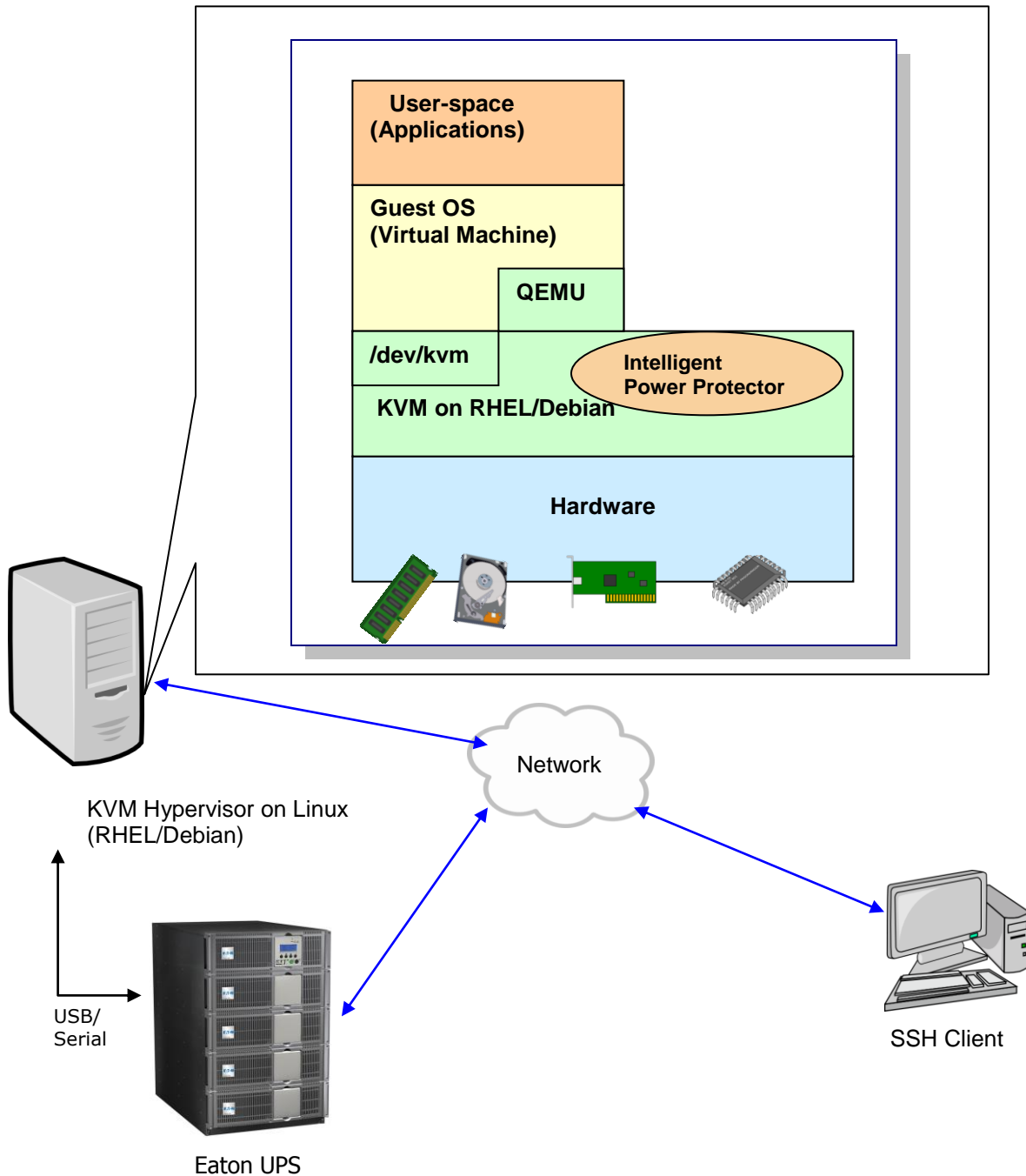
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Tested Setup

The installation and configuration of IPP has been tested upon following KVM environment:

1. RHEL 6 x86_64 (Red Hat Enterprise Linux v6)
2. Debian 5.0 (Lenny) x86_64
3. kernel version 2.6.32-71.18.1.el6.x86_64
4. qemu-kvm version 0.12.1.2-2.113.el6_0.6.x86_64
5. libvirt version 0.8.1-27.el.x86_64
6. virt-manager version 0.8.4-8.el6.noarch

1. KVM on RHEL 6 and Debian 5.0 (Lenny)



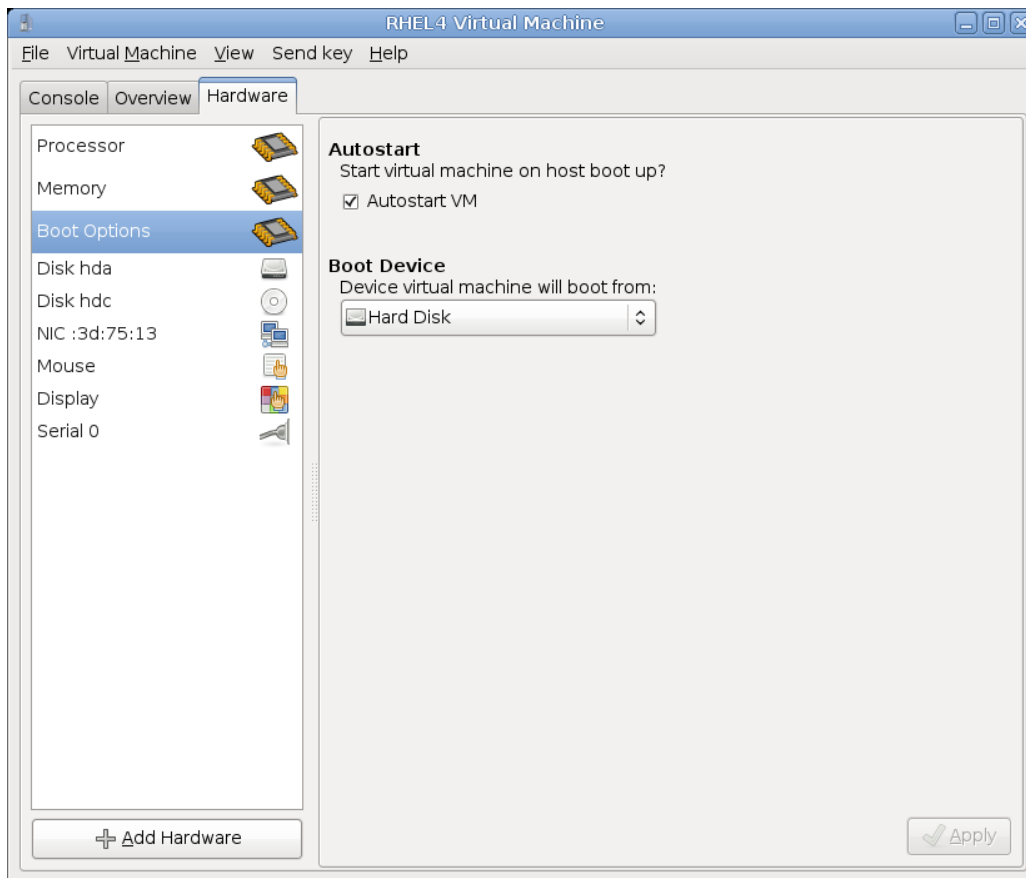
1.1. KVM configuration

Before installing Eaton **Intelligent Power Protector (IPP)** on RHEL/Debian Lenny where KVM is enabled, the following configurations have to be made:

- 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 OS 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.
- Virtio Paravirtualised drivers can be installed for better performance (and are compatible with our solution) but it is optional.

Auto start of guest machine after host boot

Virtual Machine Monitor is an administrative console which monitors and manages guest machines. To make every virtual machine start automatically, select the check box “Autostart VM” as shown in the screenshot below. It is located in **Virtual Machine Monitor** (Hardware -> Boot options of every virtual machine)



1.2. Prerequisites to install IPP on KVM enabled on RHEL6 /Debian 5.0 (Lenny)

1. KVM hypervisor (on RHEL/Debian) having minimum 5 MB free space.
2. IPP installation packages on RHEL/Debian.
3. Libvirt packages on RHEL/Debian.

1.3. IPP Installation

1.3.1. Hardware Architecture

The prerequisites for IPP installation are described in the "Intelligent Power Protector – User Manual" chapter: "Installation Prerequisites". (<http://pqsoftware.eaton.com/>)

For UPS systems compatibility, please refer to the chapter "Appendix -> Compatibility List"

1.3.2. Network architecture

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

Please make sure that the following TCP/UDP ports are enabled on KVM hypervisor Firewall

- Connections on tcp port **4679** and **4680** to enable a remote access for supervision and configuration through 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 Intelligent Power Protector.

Configuration to enable communication between Intelligent Power Protector and NMC (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
```

Configuration to enable communication between Intelligent Power Protector and Connect UPS BD/XSlot/PXGX2000:

```
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 2844 -j ACCEPT
iptables -I INPUT -p udp --dport 2845 -j ACCEPT
iptables -I OUTPUT -p udp --dport 2844 -j ACCEPT
iptables -I OUTPUT -p udp --dport 2845 -j ACCEPT
service iptables save
iptables-save
```

1.3.3. Installation

Download the latest version of IPP for Linux from Eaton web site.

Note: With IPP version 1.20, you don't need to download a separate KVM shutdown script anymore. The KVM shutdown feature is now integrated in standard IPP 1.20 shutdown script.

- Download the latest version of IPP, available on Eaton's website, in downloads section:

See <http://pqsoftware.eaton.com/>



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Then:

> select "Network solution".

> select "Linux – Xen - KVM" as Operating System

- For RHEL6 x86_64
Download Intelligent Power Protector v1.20, rpm Software Installer **x86_64** for Red Hat
« ipp-linux-x_xx_xxx-x86_64.rpm ».

- For Debian Lenny

Download Intelligent Power Protector v1.20, deb Software Installer **x86_64** for Debian
« ipp-linux-x_xx_xxx-x86_64.deb ».

- Upload the package on your KVM environment

To install IPP package:

For RHEL

```
rpm -i ipp-linux-x_xx_xxx-x86_64.rpm
```

For Debian

```
dpkg -i ipp-linux-x_xx_xxx-x86_64.deb
```

For silent installation process, please refer to Intelligent Power Protector manual.

- At the end, connect to IPP using your web browser by typing :
 - http://<@IP-or-name-of-RHEL/Debian>:4679 (For a HTTP access)
 - https://<@ IP-or-name-of- RHEL/Debian>:4680 (For a HTTPS access)
- Now IPP interface will be displayed.

2. Using IPP

After IPP installation, follow these 3 steps to use IPP. For more information about IPP refer to the IPP User Manual

2.1. Step 1 (Access)

Remote access (for RHEL/Debian)

From a remote machine, you can type the following URL in a Web browser

https://<name or IP address of Server hosting IPP>:4680/

Or

http://<name or IP address of Server hosting IPP>:4679/

In SSL mode, accept the certificate (by clicking on Yes)

(Enter **admin** as Login / **admin** as Password and click on the **Login** button)

EATON Intelligent Power Protector

What is Eaton Intelligent Power Protector?

- Intelligent Power Protector is protection software offered from Eaton Corporation at 'no charge'. It enables users to avoid data loss by gracefully shutting down computers and servers powered by an Eaton UPS in the event of an extended power outage. This software provides a clear, easy-to-use, multilingual interface from any PC with an Internet browser.
- Exceptionally versatile, Intelligent Power Protector acquires UPS information through local or network communication and can be easily deployed on many computers.
- Intelligent Power Protector can be remotely managed, configured and updated with our Intelligent Power Manager supervisory software. Intelligent Power Manager can be downloaded for no charge from Eaton for supervising / monitoring of a network of up to ten devices. Versions of Intelligent Power Manager for supervising / monitoring many devices may be purchased through an Eaton authorized reseller.

Login:

Password:

2.2. Step 2 (Configuration)


When started, the application automatically performs a **Quick scan**.

Using the Quick scan operation, you will discover:

=> 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 is Green

=> Networked UPSs through broadcast within a few seconds (Network Management Cards Network-MS (ex 66102)

The discovered UPS connected through (Network) are not automatically assigned as the Power source (You have to select the node and click on the button **Set as Power Source** the icon becomes Green )

The discovered nodes are displayed in **Settings → Auto Discovery**

For the other nodes, please 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.*

In the **Settings → Shutdown** page, assign the IP address of the UPS that powers the local Computer.

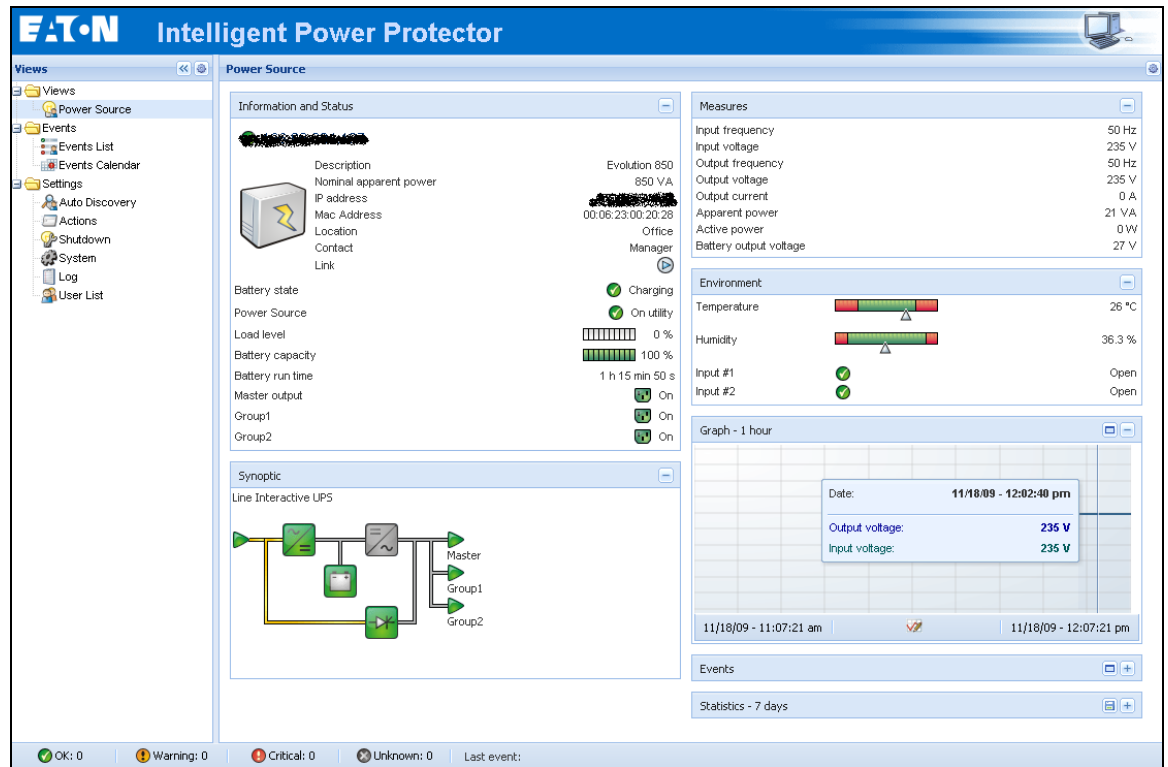
With IPP 1.20 version the standard shutdown feature now integrates KVM shutdown.

Please refer to IPP user manual for shutdown settings if needed.

- In the **Settings → User List** page, assign the access rights through "login and password"

2.3. Step 3 (Operation)

The **Views** → **Power Source** menu item (optional) allows you to supervise the current state of the UPS that powers the server running Intelligent Power[®] Protector



The **Events** → **Event List** view allows you to view the device events.



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3. References

1. <http://www.linux-kvm.org>
2. <http://www.tuxradar.com/content/howto-linux-and-windows-virtualization-kvm-and-qemu>
3. <http://www.redhat.com/f/pdf/rhev/DOC-KVM.pdf>

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