Intelligent Power Protector

User manual extension for Microsoft Virtual architectures:

- Hyper-V 6.0 Manager
- Hyper-V Server (R1&R2)



Index

1	Int	roduction	.3
2	Ins	stallation	.4
	2.1	Prerequisites	.4
	2.2	Microsoft Hyper-V Manager / Hyper-V Server R1,R2 configuration	.5
	2.3	EATON hardware architecture	.9
	2.4	Network architecture	.9
	2.5	Installation of IPP on Hyper-V Server R1,R2 and Windows Server 2008 R2 (Hyper-V Manager)
		10	
	2.6	Alarms reception:	12
	Whe	n there is a UPS status change, a notification window displays the alarms:	12
	2.7	Using IPP with Hyper-V Server R1, R2 or Hyper-V Manager	13
	2.7	7.1 Step 1 (Access)	13
	2.7	7.2 Step 2 (Configuration) When started, the application automatically performs a Quick sca	n.
		13	
	2.7	7.3 Step 3 (Operation)	14
3	Ap	pendix	15
	3.1	References	15

1 Introduction

Eaton is a first class supplier of hardware and software optimizing business continuity on your Microsoft virtual platforms worldwide. The system includes controlling proper boot and graceful shutdown of:

- The virtual machines hosted on a same physical machine.
- The main operating system hosting Microsoft Hyper-V or Hyper-V Server.

Intelligent Power® Protector is Eaton's solution to automate various data security functions. It:

- Continuously waits for information from the Mgt. Card connected to the EATON UPS.
- Warns administrators and users if AC power fails
- Proceeds to shutdown system before the end of battery backup power is reached.
- Restarts machines when AC power restarts.

Microsoft Hyper-V (or Hyper-V Server) controls the Virtual Machine's shutdown and restart functions. Version of Eaton's **Intelligent Power® Protector** can be installed on the main operating system (hosting Hyper-V).

Intelligent Power® Protector will consolidate information from the UPS which is supplying the server. Advantages of installing our protection software on the main operating system (hosting Hyper-V) include:

- Only one deployment of IPP on physical machine, to manage all virtual machines.
- Silent deployment possibility.
- Dynamic management of virtual machines configuration, with a personalized script.

This manual will guide you through the installation and configuration process of the Intelligent Power Protector on Microsoft Hyper-V (or Hyper-V Server) platform.

EATON tested virtualization security in a redundant power supply configuration, for system shutdown, electrical shutdown, and reboot.

2 Installation

Section 2 will guide the user through the installation process of **Intelligent Power® Protector** on Microsoft Hyper-V architecture. Use of Intelligent Power Protector will allow continuity of the electrical power supply to the end user's internal power system.

2.1 Prerequisites

Test configuration with Hyper-V Manager:

This procedure was validated using Microsoft Windows 2008 Enterprise R1, R2 x64 as the main operating system (hosting Hyper-V). The system had the following applications installed:

- Microsoft Hyper-V hosting several virtual machines :
 - Windows 2000 Server SP4 and Advanced Server SP4
 - Windows Server 2003 x86/x64 R2 SP2
 - Windows Server 2008 x86/x64 SP1/SP2
 - Windows XP Professional SP2/SP3 and x64 SP2
 - Windows Vista SP1/SP2 (except Home editions)
 - Windows Seven x86/x64 (except Home editions) (Only On Server 2008 R2)
 - SUSE Linux Enterprise Server 10 SP2 & 11
 - Red Hat Enterprise Linux 5.2/5.3/5.4 x86/x64
- Intelligent Power® Protector for Windows.

Test Configuration with Hyper-V Server R1, R2:

This procedure was validated using Hyper-V Server running on an x64 machine.

- Microsoft Hyper-V Server was hosting:
 - Windows 2000 Server SP4 and Advanced Server SP4
 - Windows Server 2003 x86/x64 R2 SP2
 - Windows Server 2008 x86/x64 SP1/SP2
 - Windows XP Professional SP2/SP3 and x64 SP2
 - Windows Vista SP1/SP2 (except Home editions)
 - Windows Seven x86/x64 (except Home editions) (Only on Hyper-V Server R2)
 - SUSE Linux Enterprise Server 10 SP2 & 11
 - Red Hat Enterprise Linux 5.2/5.3/5.4 x86/x64
- And Intelligent Power® Protector for Windows.
- Note: Hyper-V Server doesn't support RS232 communication port; please connect the UPS through the USB link or through the Network link.

2.2 Microsoft Hyper-V Manager / Hyper-V Server R1,R2 configuration

• For the automatic OS boot on start-up: the user must configure the physical machine to allow automatic OS boot on start-up. This is found in the machine's BIOS. For further information, see specific documentation of the physical hardware.

• Note:

It may be required to activate Virtualization Technology Enabled (in the machine's BIOS) to run Hyper-:

CPU Information -> Virtualization Technology -> Enabled

• **To enable graceful virtual machines shutdown**, it is necessary to install on each Virtual Machine the additional program "Guest Component Service" included in the operating system and to configure it.

> To install "Guest Component Service"

- Open the Hyper-V console and start your virtual machine.
- Select the Action tab -> insert the disk integration services.

- Install the Service. To check that installation works fine, verify that the software is available in the Control Panel of the virtual machine ("Add / Remove Programs").

- > To configure the services.
- Open Hyper-V console and select the virtual machine where the service was installed.
- Do a Right-click. Choose Settings -> Integration Services.
- Check the box "Operating System shutdown".

This configuration is illustrated on the following screenshot:

RHEL	5.3	
	Add Hardware Add Hardware BIOS Boot from CD Memory 256 MB Processor 1 Virtual processor I Virtual processor I Virtual processor I DE Controller 0 Hard Drive RHEL 5.3.vhd IDE Controller 1 DVD Drive None SISCI Controller Network Adapter Local Area Connection - Virtual Net COM 1 None COM 2 None Diskette Drive None	Integration Services Select the services that you want Hyper-V to offer to this virtual machine. To use the services you select, you must install them in the guest operating system and they must be supported by the guest operating system. Examples of services that might not be available on the guest operating system include Volume Shadow Copy Services and operating system shutdown. Services Operating system shutdown Time synchronization Data Exchange Heartbeat Backup (volume snapshot)
	Name RHEL 5.3 Integration Services All services offered Snapshot File Location D:\Hyper-V\RHEL 5.3 Automatic Start Action Restart if previously running Automatic Stop Action	

• To Ensure an **automatic boot** of each virtual machine when Microsoft Hyper-V starts-up, use the following procedure:

> From the "Hyper-V" manager:

- Select the virtual Machine list
- Select the "Virtual Machine"
- Select "Parameters" -> "Manage" -> "Automatic Start Action"

- Choose the appropriate parameters for the virtual machine that coincide with the start rules of the specific application.

This configuration is illustrated on the following screenshot:

RHEL 5.3	< > Q
Hardware Mardware Mardware BIOS Boot from CD Memory 256 MB Processor 1 Virtual processor IDE Controller 0 Hard Drive RHEL 5.3.vhd IDE Controller 1 DVD Drive None SCSI Controller None COM 1 None COM 2 None Diskette Drive	Automatic Start Action What do you want this virtual machine to do when the physical computer starts? Nothing Automatically start if it was running when the service stopped Automatic start delay Specify a startup delay to reduce resource contention between virtual machines. Startup delay: 300 seconds
None Management Name RHEL 5.3 Snapshot File Location D:\Hyper-V\RHEL 5.3 Automatic Start Action Always start Automatic Stop Action Shut Down	

• Follow this procedure to ensure an **automatic graceful shutdown** of each virtual machine when Microsoft Hyper-V stops:

> From the "Hyper-V" manager:

- select the virtual Machine list,
- select the "Virtual Machine"
- select "Parameters" -> "Management"-> "Automatic Stop Actions",

- choose the appropriate parameters for the virtual machine, to fit with shutdown rules of the specific application,

This configuration is illustrated on the following screenshot:

Se	ttings for RHEL 5.3	_
RHE	L 5.3	
	Hardware Add Hardware BIOS Boot from CD Memory 256 MB Processor 1 Virtual processor IDE Controller 0 Hard Drive RHEL 5.3.vhd IDE Controller 1 DVD Drive None SCSI Controller Vone None SCSI Controller Cortroller Cortal Area Connection - Virtual Net	 Automatic Stop Action What do you want this virtual machine to do when the physical computer shuts down? Save the virtual machine state Turn off the virtual machine Shut gown the guest operating system The integration service that controls shutting down the guest operating system must be installed and enabled on the virtual machine.
1	Local Area Connection - Virtual Net COM 1 None COM 2 None Diskette Drive None Management	
	Name RHEL 5.3 Integration Services All services offered	
2	 Snapshot File Location D:\Hyper-V\RHEL 5.3 Automatic Start Action Restart if previously running 	
	 Automatic Stop Action Shut Down 	
		OK Cancel Apply

Note:

With Windows Hyper-V Server, this configuration will be done remotely. MMC Microsoft console is installed on a remote computer running Windows 2008 Server or Vista SP1.

Hyper-V M	anager							
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		Win 2003	Off				Import Virtual Machine	
		Win XP SP3	On	0 %	23:14:53		Hyper-V Settings	
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2.3 EATON hardware architecture

The prerequisites for Intelligent Power Protector installation are described in the "Intelligent Power® **Protector** – User Manual" <u>chapter</u>: "Installation Prerequisites". (http://download.mgeops.com/) For UPS systems compatibility, please refer to the chapter "Appendix -> Compatibility List"

2.4 Network architecture

All hardware elements must have an operational network configuration that allows free dialog amongst each other.

Connections through the following ports must be authorized within the firewall of the main operating system:

- 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 (<u>http://www.iana.org</u>).
- Connections through TCP port **80** must be opened as a destination port (for output) on the machine hosting Intelligent Power Protector. (To enable communication between Intelligent Power Protector and Network Management Card).

To configure network parameters of the main operating system, please refer to its user manual.

2.5 Installing IPP on Hyper-V Server R1,R2 and Windows Server 2008 R2 (Hyper-V Manager)

- Download the latest version of Intelligent Power Protector Windows version package from Eaton's website : <u>http://powerquality.eaton.com/Support/Software-Drivers/default.asp</u> and choose the version windows of IPP
- Copy the package on your system
- Execute the package from the DOS Windows command and Go to the directory where you
 placed Intelligent Power Protector

 To start the installer in gr 	aphical mode, type:	
ipp_win_x_xx_xxx.exe	e -install or start	ipp_win_x_xx_xxx.exe

"IoTume in drive D has no label. Upture in drive D has no label. Upture Serial Number is J83E 6060 Directory of D:- 01/25/2818 03:84 PM 01/25/2818 03:84 PM 01/25/2818 03:81 PM 01/25/2818 03:81 PM 01/25/2818 05:36 PM 01/25/2818 05:36 PM 01/25/2818 05:36 PM 01/26/2818 05:36 PM	nt Power Protecto
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- To start the installer in silent mode, type: ipp_win_x_xx_xx.exe -install -silent



• At the end of the installation it is possible to access to the IPP web interface

2.6 Uninstalling IPP

To uninstall IPP from the DOS Window, go to the directory where you have installed the Intelligent Power Protector. (Default installation path is C:\Program Files\Eaton\IntelligentPowerProtector)

```
- To uninstall in graphical mode, type:
ipp_win_x_xx_xx.exe -uninstall
```

- To uninstall in silent mode, type: ipp_win_x_xx.exe -uninstall -silent

2.7 Useful commands

• Useful Commands to list Windows services activated : net start

🔤 Administrator: C:\Windows\system32\cmd.exe	_ 🗆 🗙
C:\rogram files\Laton\intelligentfowerfrotector/net start These Windows services are started:	
Application Experience	
Base Filtering Engine	
Certificate_Propagation	
COM+ Event System	
Cryptographic Services	
DUOM Server Frocess Launcher	
Diagnostic Policu Sewuice	
Distributed Transaction Coordinator	
DNS Client	
Eaton Intelligent Power Protector	
Group Policy Client	
Hyper-V Image Management Service	
Hyper-V Networking Management Service	
Hyper-V Virtual machine management	
INE diffu Huthir Irsec keying houries	
IPsec Policy Agent	
Network List Service	
Network Location Awareness	
Network Store Interface Service	
Plug and Play	
Power	
Remote Desktop Configuration	
Remote Desktop Services Remote Desktop Services UserMade Part Redirector	
Remote Percedure Call (RPC)	
Remote Registry	
RPC Endpoint Mapper	
Security Accounts Manager	
Server	
System Event Notification Service	
TOR ID Not DIG UN INC.	
lice Profile Semice	
Windows Fuent Log	
Windows Firewall	
Windows Management Instrumentation	
Windows Remote Management (WS-Management)	
Windows Update	
Workstation	
The command completed successfully.	
C:\Program Files\Eaton\IntelligentPowerProtector>_	

2.8 Alarms reception:

When there is a UPS status change, a notification window displays the alarms:

\Program Piles\Eaton\IntelligentPow	+Protector>			
		Notifications de 'Intellige	ent Power Protector	
		Nom Source d'alimentation Capacté batterie Autonomie batterie	ups255.extonlab.com Sur secteur 190 % 2 h 65 mn 59 s	80.
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2.9 Using IPP with Hyper-V Server R1, R2 or Hyper-V Manager

After IPP installation, follow these 3 steps to use IPP or refer to the IPP User Manual

2.9.1 Step 1 (Access)

Local access (for Hyper-V Manager on Windows 2008)

From the system where Intelligent Power[®] Protector is installed, you can use the following shortcut:
 Start -> Programs -> Eaton -> Intelligent Power Protector ->Open Eaton Intelligent Power Protector

Remote access (for Hyper-V Server or Hyper-V Manager on Windows 2008)

- From a remote machine, you can type the following URL in a Web browser https://<name or IP address of computer hosting IPP>:4680/ or http://<name or IP address of computer 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)

What is Estab Intelligent Dower Destactor?	Logio	a deste
What is Earon intelligent Power Protector?	LUYIN:	aamin
 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. 	Password:	Login
 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 		

2.9.2 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 \bigcirc)

=> Networked UPSs through broadcast within a few seconds (Network Management Cards 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.

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

2.9.3 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

iews	Over Source					
Views	Toformation and Status	0	Massing			
Power Source	Thomadon and Status		inicadarios			
Events List	166.99.224.127		Input trequency			
Events Calendar	Description	Evolution 850	Output frequency			
G Settings	Nominal apparent power	850 VA	Output voltage			
Auto Discovery	IP address	166.99.224.127	Output current			
- C Actions	Mac Address	00:06:23:00:20:28	Apparent power			
- @ Shutdown	Location	Office	Active power Battery output voltage			
System	- Contact	wanager	Dattery output voltage			
- 🗍 Log	Battery state		Environment			
User List	Power Source	On utility	Temperature			
	Load level	0%	Humidity	-		
	Battery capacity	100 %	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	Δ		
	Battery run time	1 h 15 min 50 s	Input #1	0		
	Master output	🐨 On	Input #2	Ø		
	Group1	😨 On	and the second			
	Group2	🛐 On	Graph - 1 hour			
	Synoptic			ate:	11/18/09 - 12:02:40 pm	1
	Line Interactive UPS				The second second print	
			C	utput voltage:	235 V	
			In	put voltage:	235 V	
	Group1					
	Group2		11/18/09 - 11:07:21 am	1	11/18/09 - 12	2:07:2
			Events			
			Statistics - 7 days			

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

3 Appendix

3.1 References

- "User's Manual Intelligent Power Protector" downloaded from the website : <u>http://powerquality.eaton.com</u>
- For download Eaton's software : <u>http://powerquality.eaton.com/Support/Software-Drivers/default.asp</u>
- References documents for Microsoft Hyper-V are available on <u>http://www.microsoft.com/windowsserver2008/en/us/hyperv.aspx</u>