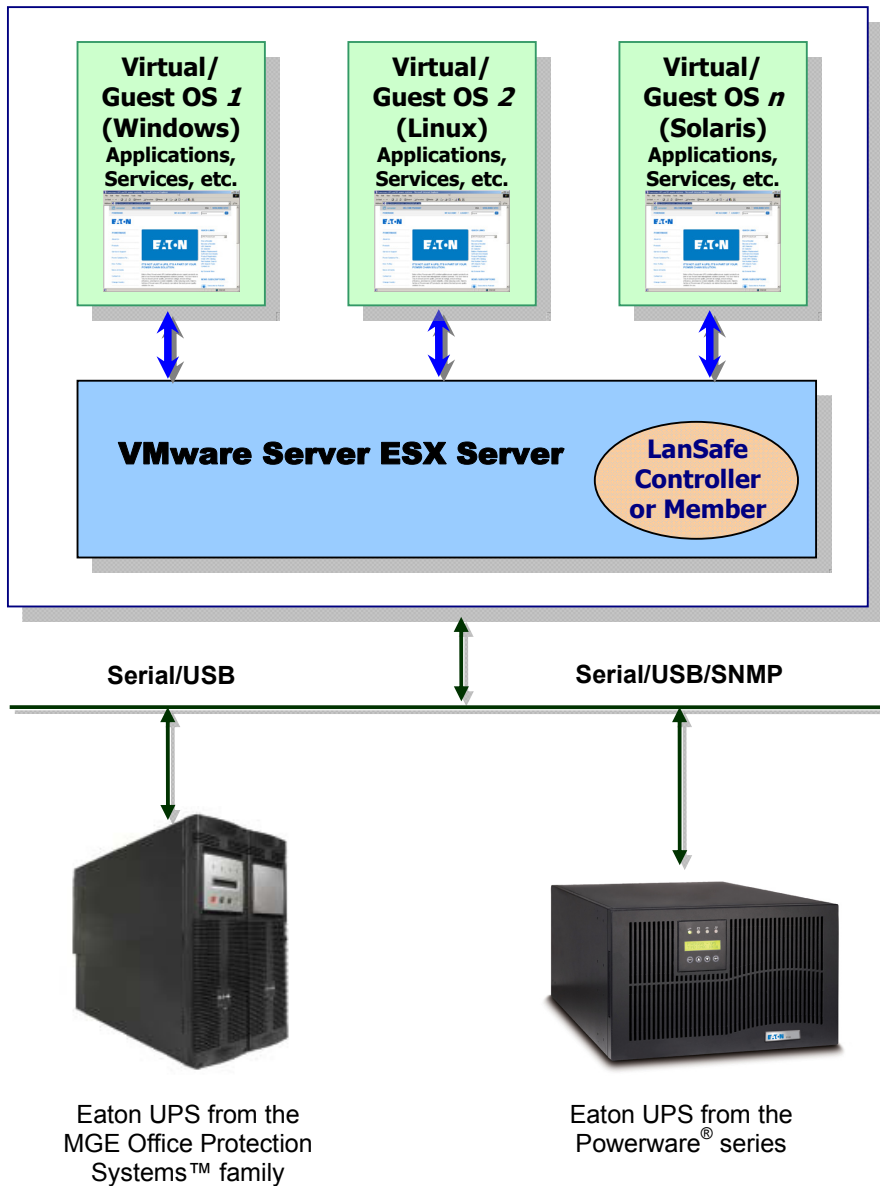


VMware ESX server host and guest operating systems architecture



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1 Introduction

Eaton® LanSafe® allows you to connect a server or workstation to Eaton UPSs via a USB, serial or SNMP network connection. The server or workstation on which LanSafe is installed can be configured as a shutdown agent. LanSafe will be notified of power events or UPS alerts. LanSafe can also be configured to allow messaging for information purposes and begin an orderly shutdown of the computer to avoid a crash, in the event of power failures that could extend beyond the normal runtime of the UPS batteries. For complete information on LanSafe, please refer to the LanSafe help and release document.

VMware® ESX controls shutdown and restart functions directly from the administration console, or from an application hosted on the ESX layer. We can install LanSafe on VMware ESX host and control the host and guest machine(s).

There are various benefits of installing the LanSafe client on the VMware host layer instead of each client machine:

- Only one binary of LanSafe on physical machine to manage all virtual machines.
- Dynamic management of virtual machines configuration with a personalized script.

This guide will help to install and configure the LanSafe client on the VMware ESX Server.

LanSafe is tested on a VMware virtualization on server with two guest operating systems for electrical power events, shutdown, low battery and reboot.

2 Installation

This guide provides information about installing and configuring LanSafe on a VMware server. These recommendations will guide you through the installation process of LanSafe on VMware ESX architecture to allow electric continuity.

2.1 Prerequisites

The following are prerequisites:

1. VMware ESX Server Machine with Host having 20 MB free space
2. VMware Infrastructure client installed on different machine
3. LanSafe 6.0 Installer tar package or Software Suite CD
4. SSH client like putty for installation and configuration
5. SCP Client like WinSCP to upload packages to VMware ESX server

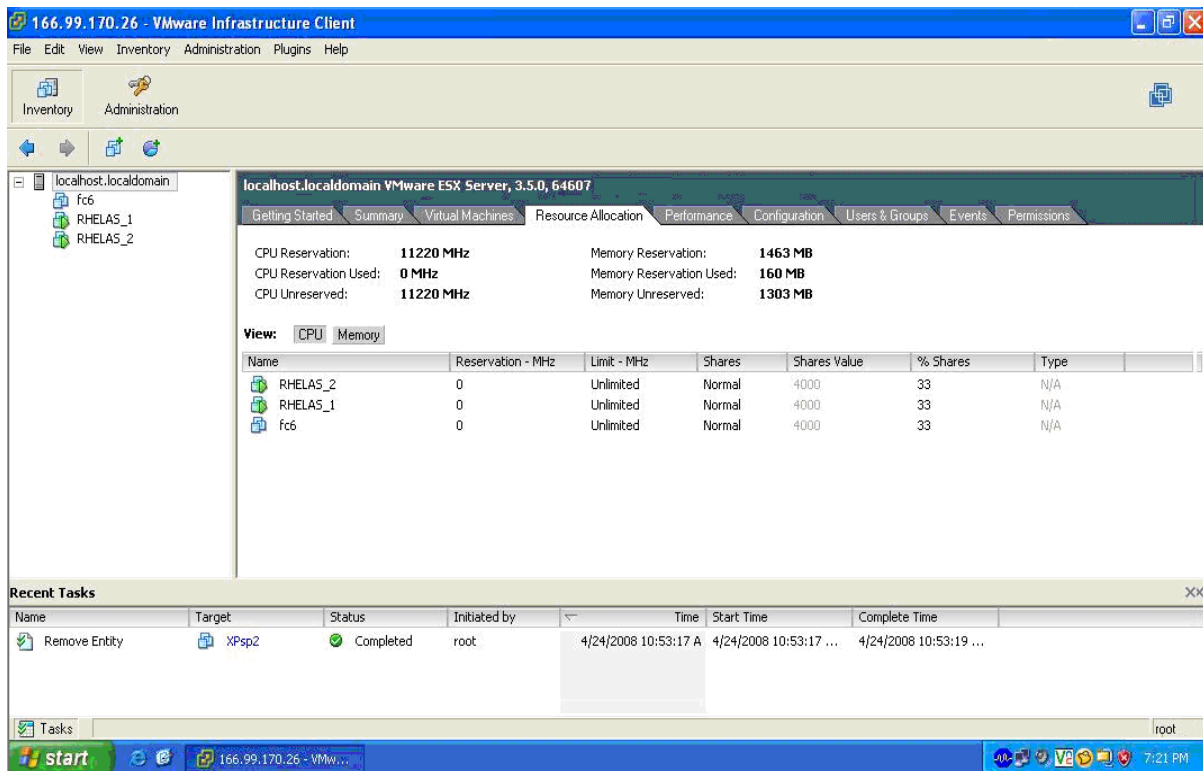
2.1.1 VMware ESX Server configuration

- For the automatic OS boot on startup: you must configure physical machine to allow automatic OS boot on startup. This setting is present in your machine's BIOS. For further information, see specific technical hardware documentation.
- To allow interactions between physical and virtual machines, VMware tools have to be installed on each virtual machine. For further information, see VMware ESX Server documentation.
- For the automatic virtual machine boot on VMware ESX startup:
From the Virtual Infrastructure Client interface, go in the "Virtual machine startup / shutdown" menu → "Configuration" → "Properties" → "Start and stop VMs with the system," and tick "enable."

Note: In the « Properties... » page, you also have the possibility to 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 illustrated on the following screenshot:



2.1.2 Network architecture

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

Please make sure that the following ports are enabled on ESX server Firewall.

To configure your **VMware ESX Server** for the network, please refer to the user manual.

- Tcp ports 3068, 3069 and 7015 need to be to open for LanSafe communication with the UPS. For more information see the Troubleshooting / FAQ section in the LanSafe help file.
- You may also need to enable Internet standard SNMP ports 161 and 162 in order to communicate with Web/SNMP cards or the SNMP Proxy Agent.
- For example:

```
esxcfg-firewall -o 200,udp,in,LanSafe
esxcfg-firewall -o 3068,tcp,in,LanSafe
esxcfg-firewall -o 3069,tcp,in,LanSafe
```

2.2 Installation

The following steps explain how to obtain the latest version of LanSafe from the Eaton Web site.

- Download tar file of LanSafe for Linux from the Eaton Web site from the following location:
<http://www.powerware.com/software/downloads/LanSafe6.asp>
- Click Download LanSafe then download
 - LS_600_linux.tar file for Linux
- Upload the package on your VMware ESX environment, with a SCP Client (Example under windows environment: WinSCP)
- Connect with SSH to the VMware server (example under Windows environment: Putty). You must have corresponding rights to execute and install programs on VMware ESX. Refer to VMware ESX for further information.
- In the upload folder, add execution right to the package by typing:
`chmod 755 LS_600_linux.tar.`
- Untar install script by following this command:
`./tar xvf LS_600_linux.tar install.sh`
- Install LanSafe by typing:
`./install.sh LS_600_linux.tar`
- Go through various installation options and LanSafe will get installed on the system

3 Appendix

3.1 References

- For installation of LanSafe please refer to the following link:
<http://www.powerware.com/Software/LanSafe6.asp>
- Reference documents for VMware ESX Server are available on VMware Web site:
http://www.VMware.com/support/pubs/vi_pubs.html
- Reference documents for VMware tools are available in Installation of VMware tools: « Basic System Administration ESX Server 3.0.1 and Virtual Center 2.0.1 » manual, chapter « Installing and Upgrading VMWare Tools”

3.2 Complementary information

VMware ESX server 3.5 Configuration

In case of power events or UPS alerts, and if it reaches the LanSafe shutdown point, LanSafe starts executing the PowerMonitor.shutdown script file. The script file executes in the following manner, and the code is given below.

1. It will check number of guest operating system running on that server.
2. It will then start guest operating system down one by one, with two seconds between each guest operating system shutdown.
3. After all guest operating systems are down, it will start shutdown of the VMware server.

It is necessary to configure the LanSafe client to be configured properly so that it will shutdown all guest operating systems and servers properly. You can modify the PowerMonitor.shutdown file to configure shutdown behavior according to your need.

To shutdown virtual machines in the order detailed in VIC, you have to edit and customize shutdown.sh and the “stopVMware” function:

```
# Customisable VMware ESX shutdown
stopVMware()
{
    # Test if we have a VMware ESX v3 setup
    if [ -x /usr/bin/vmware ]
    then
        ESXV3=`/usr/bin/vmware -v | grep "ESX Server 3"`
        if [ -n "$ESXV3" ]
        then
            # Get the VM list
            VMLIST=`/usr/bin/vmware-cmd -l`

            for VM in $VMLIST
            do
                # Get the VM state
                VMSTATE=`/usr/bin/vmware-cmd "$VM" getstate -q`

                # Guest OS shutdown if VMSTATE is equal to "on"
                if [ "$VMSTATE" == "on" ]
                then
                    /usr/bin/vmware-cmd $VM stop trysoft
```

```
        # delay a bit the next sequence
        sleep 2
    fi
done
# Delay for 1 minute to give the VMs more time
# to cleanly shutdown
sleep 60
fi
fi
}
```

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