

**Power Protection Manager (PPM) Manual
NEXT UPS Systems
Power Protection Manager (PPM) for VMware
vCenter Server – v1.2.1 (build vmw-vcs.20251024)**

BELGIUM

NEXT UPS Systems BV

Relegem Business Park
Poverstraat 138
1731 Relegem
Belgium

+32 2 540 89 14
info@nextups.eu
www.nextups.eu

THE NETHERLANDS

NEXT UPS Systems BV

Winthontlaan 200
3526KV Utrecht
The Netherlands

+31 492 54 18 17
info@nextups.eu
www.nextups.eu

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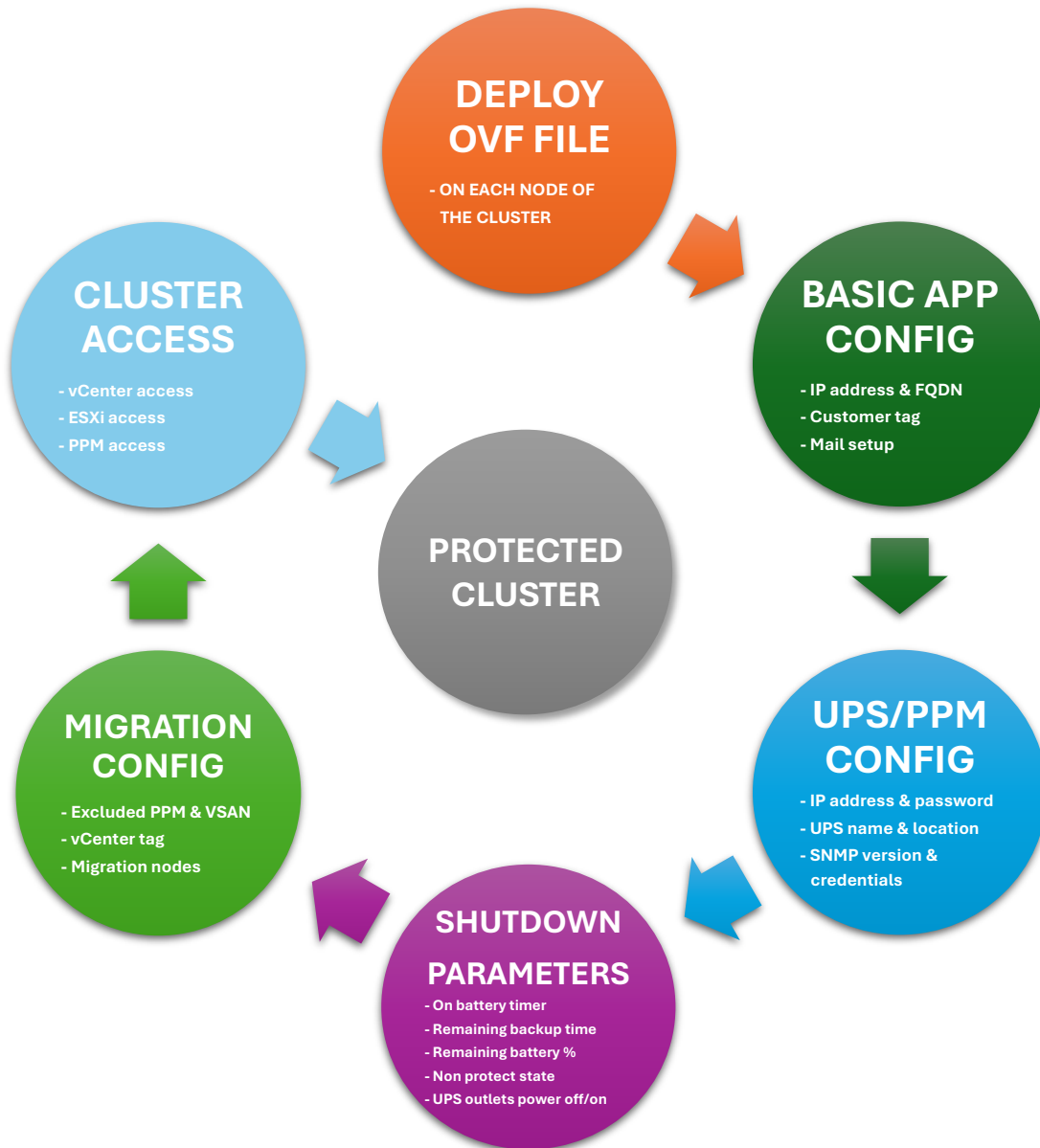
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1. Overview of the software and its features

NEXT UPS Systems Power Protection Manager (PPM) is a virtual appliance which communicates with SNMP/WEB Interface II (Network Monitoring Card) for UPSs. PPM provides event logs, user notification and protects operation systems to shutdown gracefully. With PPM, applications can save data and documents before the operating system shuts down.

Installation & configuration overview:



2. Requirements for pre-installation (system requirements)

- The PPM virtual appliance can be installed on VMware vSphere 8.0 and up, managed by VMware vCenter Server 8.0 and up.
- 2 vCPU
- 2GB vMemory
- 25GB free space on datastore

3. Steps and instructions for installation

Install the virtual appliance on each node in the cluster. For cluster overview and configuration of the migration process see chapter **4.2.5 MIGRATION CONFIGURATION**.

For deploying a virtual appliance in VMware vCenter Server to install Power Protection Manager (PPM), you need to:

STEP 1.

Download the PPM zip file on <https://nextups.eu/software/ppm-vmware/#downloads>

Extract the files from the downloaded file NEXTUPS-PPM-VMWARE-VCS_v1.2.1.zip to an accessible location.

- NEXTUPS-PPM-VCS.ovf
- NEXTUPS-PPM-VCS-0.vmdk

STEP 2.

Connect to VMware vCenter using a web browser and log in as a user that has permission to create, start, and stop virtual machines.

STEP 3.

Select 'Deploy OVF Template' and select the two locally extracted files:

Click NEXT to proceed

STEP 4.

Enter a name for the virtual machine, e.g. NEXTUPS-PPM-VCS-ESXITEST01, and select a location (datacenter) for the virtual machine:

Deploy OVF Template

- Select an OVF template
- Select a name and folder**
- Select a compute resource
- Review details
- Select storage
- Ready to complete

Select a name and folder

Specify a unique name and target location

Virtual machine name:

Select a location for the virtual machine.

ppmvcstest01.sxsrvtan

PPM-DC

☐ Customize this virtual machine's hardware

CANCEL BACK NEXT

Click NEXT to proceed

STEP 5.

Select the desired node in the cluster and check the 'Automatically power on deployed VM' box:

PPM needs to be installed on each node in the cluster. For cluster overview and configuration of the migration process see chapter **4.2.5 MIGRATION CONFIGURATION**.

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource**
- Review details
- Select storage
- Ready to complete

Select a compute resource

Select the destination compute resource for this operation

PPM-DC

PPM-CLU

ppmesxitest01.sxsrvtan

ppmesxitest02.sxsrvtan

PPM-CLU2

Compatibility

✓

Compatibility checks succeeded.

☒ Automatically power on deployed VM

CANCEL BACK NEXT

Click NEXT to proceed

STEP 6.

Review the template details and accept the advanced configuration options:

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details**
- Select storage
- Select networks
- Ready to complete

Review details

Verify the template details.

⚠ The OVF package contains advanced configuration options, which might pose a security risk. Review the advanced configuration options below. Click next to accept the advanced configuration options.

| | |
|------------------------|---|
| Publisher | No certificate present |
| Download size | Unknown |
| Size on disk | Unknown (thin provisioned) 25.0 GB (thick provisioned) |
| Advanced configuration | <pre> vmotion.checkpointSVGAPrimarySize = 16777216 pciBridge0.present = TRUE tools.capability.verifiedSamToken = TRUE vmware.tools.internalversion = 12421 vmware.tools.requiredversion = 12448 RemoteDisplay.maxConnections = -1 usb.pciSlotNumber = 33 sata0.pciSlotNumber = 36 usb1.speed = 2 pciBridge1.virtualDev = pciRootBridge cpuid.coresPerSocket = 2 usb1.port = 1 usb1.parent = -1 usb0.parent = -1 vmotion.svga.mobMaxSize = 16777216 tools.guest.desktop.autolock = TRUE pciBridge0.pxm = 0 pciBridge0.functions = 1 scsi0.sasWWID = 50 05 05 67 97 5a dd 90 hpet0.present = TRUE guestinfo.detailed.data = architecture='X86' bitness='64' distroAddlVersion='24.04.2 LTS (Noble Numbat)' distroName='Ubuntu' distroVersion='24.04' familyName='Linux' kernelVersion='6.8.0-56-generic' prettyName='Ubuntu 24.04.2 LTS' migrate.hostLog = /NEXTUPS-PPM-VCS-baa3210e.hlog numa.autosize.cookie = 20022 vmotion.svga.graphicsMemoryKB = 16384 monitor.phys_bits_used = 45 svgx.present = TRUE </pre> |

CANCEL
BACK
NEXT

Click NEXT to proceed

STEP 7.

Select an appropriate local datastore depending on the customer configuration.

Default setting for the virtual disk format is Thick Provision, but it is recommended to change it to Thin Provision:

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details
- Select storage**
- Select networks
- Ready to complete

Select storage

Select the storage for the configuration and disk files

☐ Encrypt this virtual machine (Requires Key Management Server)

Select virtual disk format: Thin Provision

VM Storage Policy: Datastore Default

☐ Disable Storage DRS for this virtual machine

| | Name | Storage Compatibility | Capacity | Provisioned | Free |
|----------------------------------|-----------------|-----------------------|-----------|-------------|-----------|
| <input checked="" type="radio"/> | ds-ppmesitest01 | --- | 121.75 GB | 317.88 GB | 93.18 GB |
| <input type="radio"/> | ds-shared | --- | 849.75 GB | 781.96 GB | 201.91 GB |
| <input type="radio"/> | dsha-heartbeat | --- | 9.75 GB | 1.41 GB | 8.34 GB |
| <input type="radio"/> | dsha-heartbeat2 | --- | 9.75 GB | 1.41 GB | 8.34 GB |

Manage Columns

Items per page: 10 4 items

Compatibility

✓ Compatibility checks succeeded.

CANCEL
BACK
NEXT

Click NEXT to proceed

STEP 8.

Select an appropriate destination network depending on the customer configuration:

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details
- Select storage
- Select networks**
- Ready to complete

Select networks

Select a destination network for each source network.

| Source Network | Destination Network |
|----------------|---------------------|
| VM Network | VM Network |

Manage Columns 1 item

IP Allocation Settings

IP allocation: Static - Manual

IP protocol: IPv4

CANCEL BACK NEXT

Click NEXT to proceed

STEP 9.

Review your selections and click FINISH to start the deployment task:

Deploy OVF Template

- Select an OVF template
- Select a name and folder
- Select a compute resource
- Review details
- Select storage
- Select networks
- Ready to complete**

Ready to complete

Review your selections before finishing the wizard

✓ Select a name and folder

| | |
|---------------|---------------------------|
| Name | NEXTUPS-PPM-VCS-ESXTEST01 |
| Template name | NEXTUPS-PPM-VCS |
| Folder | PPM-DC |

✓ Select a compute resource

| | |
|----------|-------------------------|
| Resource | ppmesxtest01.sxsrsv.lan |
|----------|-------------------------|

✓ Review details

| | |
|---------------|---------|
| Download size | Unknown |
|---------------|---------|

✓ Select storage

| | |
|-----------------|--|
| Size on disk | Unknown |
| Storage mapping | 1 |
| All disks | Datastore: ds-ppmesxtest01; Format: Thin provision |

✓ Select networks

| | |
|-----------------|------------|
| Network mapping | 1 |
| VM Network | VM Network |

IP allocation settings

| | |
|---------------|-----------------|
| IP protocol | IPv4 |
| IP allocation | Static - Manual |

CANCEL BACK FINISH

Repeat these steps for each node in the cluster.

Wait for the VM's to be created and proceed to **4.2 CONFIGURATION** for configuration of PPM(s), UPS(s) and migration/shutdown parameters.

4. Configuration and instructions for setup

4.1 PPM COMMANDS INDEX

| | |
|------------------------------------|--|
| -h, --help | Show this help information |
| --release-notes | Display release notes |
| --set-appliance-ip-dhcp | Set appliance DHCP IP configuration |
| --set-appliance-ip-static | Set appliance STATIC IP configuration |
| --set-ppm-password | Set ppm user password |
| --mail-setup | Set mail configuration |
| --mail-test | Test mail configuration |
| -S, --start | Start PPM monitoring |
| -R, --restart | Restart PPM monitoring |
| -K, --stop | Stop PPM monitoring |
| -s, --status | Display UPS system information |
| -l, --logs | Display all logs |
| -c, --clear | Clear all logs |
| -e, --export | Export log file |
| -c, --config | Display configuration file |
| -u, --update | Update (edit) configuration file |
| customer_tag | Customer tag (name) for use with mail communication |
| timezone | SNTP time zone |
| ups1_ip | UPS1 IPv4 address |
| ups1_pass | UPS1 root password |
| ups2_ip | UPS2 IPv4 address |
| ups2_pass | UPS2 root password |
| upssnmp_version | UPS SNMP version |
| upssnmpv2c_community | UPS SNMP v2c private configured community string |
| upssnmpv3_user | UPS SNMP v3 user |
| upssnmpv3_userauth | UPS SNMP v3 user authentication |
| upssnmpv3_userauthprotocol | UPS SNMP v3 user authentication protocol: MD5 |
| upssnmpv3_userpriv | UPS SNMP v3 user private password |
| upssnmpv3_seclevel | UPS SNMP v3 security level |
| upsnonprotectstate_action | Action to take when UPS state is 'Unknown', 'Off/Standby' or 'On Bypass' |
| uponbattery_timer | Timer to elapse before executing shutdown procedure |
| upsremaining_minutes | UPS minimum remaining backup time in minutes before executing shutdown procedure |
| upsremaining_percentage | UPS minimum remaining backup percentage before executing shutdown procedure |
| upsoutlets_timeroff | Timer in minutes (m) to elapse before UPS power outlets are powered off |
| upsoutlets_timeron | Timer in minutes (m) to elapse before UPS power outlets are powered on |
| vmhandling_mode | Virtual machine handling mode |
| vmhandlingshutdownpriogroup1_delay | Delay in seconds (s) to ensure virtual machines in priority group 1 have adequate time to shut down or suspend, before handling the next group |
| vmhandlingshutdownpriogroup2_delay | Delay in seconds (s) to ensure virtual machines in priority group 2 have adequate time to shut down or suspend, before handling the next group |
| vmhandlingshutdownpriogroup3_delay | Delay in seconds (s) to ensure virtual machines in priority group 3 have adequate time to shut down or suspend, before handling the next group |
| vmhandlingshutdownpriogroup4_delay | Delay in seconds (s) to ensure virtual machines in priority group 4 have adequate time to shut down or suspend, before handling the next group |

| | |
|-------------------------|--|
| ppmvm_tag | PPM appliance virtual machine tag (name). This virtual machine will be excluded from the migration/shutdown process |
| vsanvm_tag | VSAN (HCI storage) appliance virtual machine tag (name). This virtual machine will be excluded from the migration/shutdown process |
| vcsvm_tag | vCenter appliance virtual machine tag (name). When set with the virtual machine name of the vCenter appliance, this VM will receive a graceful shutdown before the node (hypervisor) itself shuts down |
| vcs_user | vCenter admin user |
| vcs_pass | vCenter admin password |
| vcs_fqdn | vCenter FQDN |
| ppmownernodeesxi_user | PPM owner node ESXi root user |
| ppmownernode_ip | PPM owner node IPv4 address |
| ppmownernode_fqdn | PPM owner node FQDN |
| ppmownernodeesxi_pass | PPM owner node ESXi root password |
| esxi1migrationnode_ip | ESXi1 migration node IPv4 address |
| esxi1migrationnode_fqdn | ESXi1 migration node FQDN |
| esxi2migrationnode_ip | ESXi2 migration node IPv4 address |
| esxi2migrationnode_fqdn | ESXi2 migration node FQDN |
| esxi3migrationnode_ip | ESXi3 migration node IPv4 address |
| esxi3migrationnode_fqdn | ESXi3 migration node FQDN |
| mail_recipient1 | Alert mail recipient1 |
| mail_recipient2 | Alert mail recipient2 |
| -i, --import | Import configuration from given file |
| -e, --export | Export configuration file |

Return Output:

```
192.168.241.248 - PuTTY
GNU nano 7.2 /opt/ppm/netplan/ppm_appliance_ip_static.yaml
# This is the configuration template for setting static IP address on the available network interface on your system.
# Please make the necessary changes and save them with CTRL+O. Then exit this template with CTRL+X.
#
#####
network:
  version: 2
  ethernet:
    ens192:
      dhcp4: no
      optional: true
      addresses:
        # Change the below to the appropriate IP address, including subnet prefix [CIDR notation]. Don't change the indentation style.
        - 192.168.1.248/24
      nameservers:
        # Change the below to the appropriate IP address(es). Don't change the indentation style.
        addresses: [192.168.1.1, 1.1.1.1, 8.8.8.8]
      routes:
        - to: default
          # Change the below to the appropriate IP address. Don't change the indentation style.
          via: 192.168.1.1
```

- **Set customer tag**

The customer tag (name) is a variable to identify your configuration. It will be used in the configuration files and in the subject field for mail communication:

Command: `sudo PPM -c -u customer_tag '<value>'`

[IMPORTANT] Only alphanumeric and `_` characters are allowed.

Return Output:

```
sudo PPM -c -u customer_tag 'NUS-EMEA'

PPM: customer_tag option has been updated.
PPM: Restarting service to apply new value...
```

- **Set the SNTP time zone**

Default setting is 'Europe/Brussels'. Change if desired according to your current time zone:

Command: `sudo PPM -c -u timezone 'Europe/Brussels'`

[IMPORTANT] Possible values are only the official TZ identifier names, see:

https://en.wikipedia.org/wiki/List_of_tz_database_time_zones for the full list.

Example values are: Europe/Brussels | Europe/Amsterdam | Europe/Paris | GB | UTC | Etc/GMT+3 | CET | CEST

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u timezone 'Europe/Brussels'

PPM: timezone option has been updated.
```

- **Set mail notification**

For configuring the mail notifications, an SMTP server, TLS encryption port, sender account, password and at least 1 recipient must be configured:

Command: `sudo PPM --mail-setup`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM --mail-setup

Enter the SMTP server: smtp.office365.com
Enter the SMTP port (TLS): 587
Enter the sender account address: service@nextups.eu
Enter the sender account password:

Enter the mail recipient1 address: service@nextups.eu
Enter the mail recipient2 address or press [ENTER] to leave blank:

Sending test mail From: service@nextups.eu, To: service@nextups.eu, SMTP:
smtp.office365.com, Port: 587
Please check your inbox.
```

A test mail will be sent, check the inbox of the provided recipient.
Both mail recipients can be reconfigured separately:

Command: `sudo PPM -c -u mail_recipient1 '<value>'`
`sudo PPM -c -u mail_recipient2 '<value>'`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u mail_recipient2 'service2@nextups.eu'

PPM: mail_recipient2 option has been updated.
PPM: Restarting service to apply new value...
```

After configuration of the mail recipients, the settings can be checked by sending a test mail:

Command: `sudo PPM --mail-test`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM --mail-test

Sending test mail From: service@nextups.eu, To: service@nextups.eu
Please check your inbox.
```

Check the configuration file

After modifying the values, the settings can be checked by displaying the configuration file:

Command: `sudo PPM -c`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c

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Configuration file:

CUSTOMER TAG                               : NUS-EMEA
SNTP TIMEZONE                              : Europe/Brussels

UPS1 IP ADDRESS                            :
UPS1 PASSWORD                              :
UPS2 IP ADDRESS                            :
UPS2 PASSWORD                              :
UPS SNMP VERSION                           : 3
UPS SNMP V2C COMMUNITY                     : private
UPS SNMP V3 USER NAME                     :
UPS SNMP V3 USER AUTHENTICATION PASSWORD   :
UPS SNMP V3 USER AUTHENTICATION PROTOCOL   : MD5
UPS SNMP V3 USER PRIVATE PASSWORD         :
UPS SNMP V3 USER SECURITY LEVEL            : noAuthNoPriv

UPS NON PROTECT STATE ACTION                : donothing
UPS ON BATTERY TIMER (seconds | minutes)    : disabled
UPS MINIMUM REMAINING BACKUP TIME THRESHOLD (minutes) : disabled
UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD (%) : 30

UPS OUTLETS POWER-OFF TIMER (minutes)       :
UPS OUTLETS POWER-ON TIMER (minutes)        :

VM HANDLING MODE                           : migrate

PPM APPLIANCE VIRTUAL MACHINE TAG           :
VSAN APPLIANCE VIRTUAL MACHINE TAG          :
VCENTER SERVER APPLIANCE VIRTUAL MACHINE TAG :

VCENTER SERVER USER                        :
VCENTER SERVER FQDN                        :
VCENTER SERVER PASSWORD                    :

PPM OWNER NODE ESXI USER                   :
PPM OWNER NODE IP ADDRESS                   :
PPM OWNER NODE FQDN                         :
PPM OWNER NODE ESXI PASSWORD               :

ESXI1 MIGRATION NODE IP ADDRESS             :
ESXI1 MIGRATION NODE FQDN                   :
ESXI2 MIGRATION NODE IP ADDRESS             :
ESXI2 MIGRATION NODE FQDN                   :
ESXI3 MIGRATION NODE IP ADDRESS             :
ESXI3 MIGRATION NODE FQDN                   :

MAIL SENDER                                : service@nextups.eu
MAIL RECIPIENT1                             : service@nextups.eu
MAIL RECIPIENT2                             :
```

4.2.2 UPS/PPM CONFIGURATION

This section covers the configuration for communications with one or two UPSs. See chapter 4.2.4 MIGRATION/SHUTDOWN PARAMETERS for more info on how to configure the timings for the shutdown.

- **Set up the UPS IP address/password and UPS name/location**

First configure the SNMP settings in the **UPS network interface – NMC System page**. It is strongly recommended to configure both UPS and PPM with a static IP address in your network. Set the IP address, subnet mask, gateway and DNS and click the save button.

The screenshot shows the 'Settings > NMC System' page. The 'System Configuration' section is expanded, showing fields for BootP/DHCP (Disable), IP Address (10.12.34.102), Subnet Mask (255.255.255.0), Gateway Address (10.12.34.254), Primary DNS (10.12.34.254), Secondary DNS (0.0.0.0), IPv6 (Enable), IPv6 Auto Configuration (Enable), IPv6 Address 1 (0), Prefix length (0), IPv6 Gateway Tunnel (0.0.0.0), IPv6 Local Address (FE80::220:85FF:FEES:CCB), and IPv6 Address 2 (0). A 'Save' button is at the bottom right.

In addition to the IP address, a UPS description (name) and UPS location can be set in the **UPS network interface – NMC System page**. Fill in an appropriate name and location for the UPS and click the below save button.

[IMPORTANT] any blank characters (space) in these settings will be converted to _ (underscore) in the PPM.

The screenshot shows the 'Settings > NMC System' page. The 'SNMP' section is expanded, showing fields for SNMP Support (v3), SNMP Port Number (161), SNMP Trap Port Number (162), HTTP (Disable), SSH Connection (Enable), ModbusTCP Connection (Disable), SMTP (Enable), UPS Description (UPS1GATEWAY), UPS Location (TDSRV-EL7FL2), Default Language (Auto), Session expiration (30), History Log Interval (60), and Statistics Log Interval (60). A 'Save' button is at the bottom right.

After configuring the UPS IP address, up to 2 UPSs can be monitored in the PPM, if two UPSs are configured both will be monitored simultaneously for executing the shutdown settings. See chapter 4.2.4 MIGRATION/SHUTDOWN PARAMETERS for more information on the shutdown configuration.

Set the UPS(s) IP address(es) in PPM

To set the IP address(es) of the monitored UPS(s) in PPM:

Command: `sudo PPM -c -u ups1_ip '<value>'`
`sudo PPM -c -u ups2_ip '<value>'`

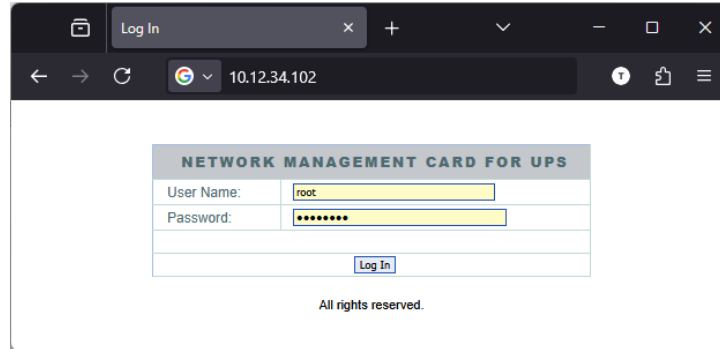
Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u ups1_ip '10.12.34.102'

PPM: ups1_ip option has been updated.
PPM: Restarting service to apply new value...
```

Set the UPS(s) password(s) in PPM (optional)

In order to use the UPS power outlets off/on control after the shutdown command, it is mandatory to configure the SNMP interface password for the root user, as used in the web interface login.



The screenshot shows a web browser window with the address bar displaying '10.12.34.102'. The page title is 'Log In'. The main content area is titled 'NETWORK MANAGEMENT CARD FOR UPS'. It contains a login form with two input fields: 'User Name:' with the value 'root' and 'Password:' with masked characters. Below the password field is a 'Log In' button. At the bottom of the page, it says 'All rights reserved.'

To set the UPS root password(s) of the monitored UPS(s) in PPM:

Command: `sudo PPM -c -u ups1_pass '<value>'`
`sudo PPM -c -u ups2_pass '<value>'`

[IMPORTANT] Only alphanumeric and !*#\$%&_ - characters are allowed

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u ups1_pass 'password'

PPM: ups1_pass option has been updated.
PPM: Restarting service to apply new value...
```

- **Set up the UPS SNMP version**

For secure communication with the UPS either SNMP v2c or SNMP v3 can be used.

Default setting on the network card of the UPS is version SNMP v3 but it can be changed to SNMP v2c. However, for security reasons it is recommended to use SNMP v3.

Set accordingly to the settings in the **UPS network interface – NMC System page**, parameter *SNMP Support*: (default setting SNMP v3).

For both communication methods additional settings are mandatory, first configure those on the SNMP interface of the UPS before proceeding the config of the PPM.

← → ↻ 🔒 https://10.12.34.102/authority_ok_with_password.html

next
UPS SYSTEMS

- UPS Monitoring
- UPS Status
- UPS Alarm
- UPS Parameters
- UPS Powered Devices
- UPS Identification
- UPS Management
- UPS Battery Test
- UPS Battery Test Schedule
- SNMP TRAP Receivers
- UPS Configuration
- UPS Control
- UPS Shutdown
- Shutdown Schedule
- Settings
- NMC System
- Reboot System
- Access Control
- Date and Time
- SNMPv3 USM Table
- Wake On LAN
- Email Notification
- Firmware Upload
- File Management
- Logs
- UPS Log
- UPS Statistics Log
- Event Log
- System Log

NETWORK MANAGEMENT CARD FOR UPS

LINE: INT
Location: TDSRV-EL7FL2
2025/03/26 08:33:39 [Logout](#)

Settings » NMC System

System Configuration

| | |
|-------------------------|--------------------------|
| BootP/DHCP | Disable |
| IP Address | 10.12.34.102 |
| Subnet Mask | 255.255.255.0 |
| Gateway Address | 10.12.34.254 |
| Primary DNS | 10.12.34.254 |
| Secondary DNS | 0.0.0.0 |
| IPv6 | Enable |
| IPv6 Auto Configuration | Enable |
| IPv6 Address 1 | |
| Prefix length | 0 |
| IPv6 Gateway Tunnel | 0.0.0.0 |
| IPv6 Local Address | FE80::200:85FF:FEES:C0B8 |
| IPv6 Address 2 | |

Save

| | |
|------------------------------|---------------|
| SNMP Support | SNMP v3 |
| SNMP Port Number | SNMP v1 |
| SNMP Trap Port Number | SNMP v2c |
| HTTP | SNMP v3 |
| SSH Connection | Disable |
| ModbusTCP Connection | Enable |
| SMTP | Enable |
| UPS Description | UPSDSRVTEST02 |
| UPS Location | TDSRV-EL7FL2 |
| Default Language | Auto |
| Session expiration(Min) | 30 |
| History Log Interval(Sec) | 60 |
| Statistics Log Interval(Min) | 60 |

Save

Set the selected SNMP version in PPM

Default setting is SNMP v3 but can be changed to SNMP v2c. However, for security reasons it is recommended to use SNMP v3:

Command: `sudo PPM -c -u upssnmp_version '<value>'`

[IMPORTANT] Valid values are: 2c | 3

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upssnmp_version '3'
PPM: upssnmp_version option has been updated.
PPM: Restarting service to apply new value...
```

- **Set up the SNMP v2c parameters**

By selecting the SNMP v2c communication the private community string is mandatory.

The private community string, as used by PPM, can be changed in the **UPS network interface – SNMPv1/2 Configuration page**. The default value for *Private Community String* in the interface is 'private', but can be changed to any value up to 20 characters.

Set the community string in PPM

Default value is 'private'.

Set the community string in PPM accordingly to the private community string in the UPS network interface:

Command: `sudo PPM -c -u upssnmpv2c_community '<value>'`

[IMPORTANT] Only alphanumeric and `_` - characters allowed with a maximum of 20 characters

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upssnmpv2c_community 'private'

PPM: upssnmpv2c_community option has been updated.
PPM: Restarting service to apply new value...
```

- **Set up SNMP v3 parameters**

By selecting the SNMP v3 communication a username, authentication method and password(s) needs to be set.

First configure the credentials and security level in the **UPS network interface – SNMPv3 USM Table page**.

[IMPORTANT] Only minor alphanumeric characters are allowed for the SNMPv3 user name.

Set the SNMP v3 parameters of the PPM accordingly to the settings in the UPS network interface.

Set SNMP v3 user name

Set accordingly to the settings in the **UPS network interface – SNMPv3 USM Table** page:

Command: `sudo PPM -c -u upssnmpv3_user '<value>'`

[IMPORTANT] Only minor alphanumeric characters are allowed for the SNMPv3 user name.

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upssnmpv3_user 'snmpuser'
PPM: upssnmpv3_user option has been updated.
PPM: Restarting service to apply new value...
```

Set SNMP v3 user authentication password

Set accordingly to the settings in the **UPS network interface – SNMPv3 USM Table** page:

Command: `sudo PPM -c -u upssnmpv3_userauth '<value>'`

[IMPORTANT] Only alphanumeric and _- characters are allowed and needs to have a minimum of 8 characters.

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upssnmpv3_userauth 'snmppass'
PPM: upssnmpv3_userauth option has been updated.
PPM: Restarting service to apply new value...
```

Set SNMP v3 authentication protocol

Only valid value is 'MD5', set accordingly to the settings in the **UPS network interface – SNMPv3 USM Table** page:

Command: `sudo PPM -c -u upssnmpv3_userauthprotocol '<value>'`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upssnmpv3_userauthprotocol 'MD5'
PPM: upssnmpv3_userauthprotocol option has been updated.
PPM: Restarting service to apply new value...
```

Set SNMP v3 user private password

Set accordingly to the settings in the **UPS network interface – SNMPv3 USM Table** page:

Command: `sudo PPM -c -u upssnmpv3_userpriv '<value>'`

[IMPORTANT] Only alphanumeric and _- characters are allowed and needs to have a minimum of 8 characters.

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upssnmpv3_userpriv 'snmppass'
PPM: upssnmpv3_userpriv option has been updated.
PPM: Restarting service to apply new value...
```

Set SNMP v3 security level

Default value is 'noAuthNoPriv'. Set accordingly to the settings in the **UPS network interface – SNMPv3 USM Table** page:

Command: `sudo PPM -c -u upssnmpv3_seclevel '<value>'`

[IMPORTANT] Valid values are: noAuthNoPriv | authNoPriv | authPriv

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upssnmpv3_seclevel 'authNoPriv'

PPM: upssnmpv3_seclevel option has been updated.
PPM: Restarting service to apply new value...
```

Check the configuration file

All settings can be checked in the configuration file or with below command:

Command: `sudo PPM -c`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c

NEXT UPS Systems - Power Protection Manager (PPM) for VMware vCenter Server - v1.2.1 (build vmw-
vcs.20251024)

Configuration file:

CUSTOMER TAG                               : NUS-EMEA
SNTP TIMEZONE                             : Europe/Brussels

UPS1 IP ADDRESS                           : 10.12.34.102
UPS1 PASSWORD                             : *****
UPS2 IP ADDRESS                           : 10.12.34.103
UPS1 PASSWORD                             : *****
UPS SNMP VERSION                         : 3
UPS SNMP V2C PRIVATE COMMUNITY            : private
UPS SNMP V3 USER NAME                    : snmpuser
UPS SNMP V3 USER AUTHENTICATION PASSWORD : snmppass
UPS SNMP V3 USER AUTHENTICATION PROTOCOL  : MD5
UPS SNMP V3 USER PRIVATE PASSWORD        : snmppass
UPS SNMP V3 USER SECURITY LEVEL           : authNoPriv

UPS NON PROTECT STATE ACTION               : donothing
UPS ON BATTERY TIMER (seconds | minutes)   : disabled
UPS MINIMUM REMAINING BACKUP TIME THRESHOLD (minutes) : disabled
UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD (%) : 30

UPS OUTLETS POWER-OFF TIMER (minutes)      : disabled
UPS OUTLETS POWER-ON TIMER (minutes)       : disabled

VM HANDLING MODE                          : migrate

PPM APPLIANCE VIRTUAL MACHINE TAG          :
VSAN APPLIANCE VIRTUAL MACHINE TAG        :
VCENTER SERVER APPLIANCE VIRTUAL MACHINE TAG :

VCENTER SERVER USER                       :
VCENTER SERVER FQDN                       :
VCENTER SERVER PASSWORD                   :

PPM OWNER NODE ESXI USER                  :
PPM OWNER NODE IP ADDRESS                 :
PPM OWNER NODE FQDN                      :
PPM OWNER NODE ESXI PASSWORD              :

ESXI1 MIGRATION NODE IP ADDRESS           :
ESXI1 MIGRATION NODE FQDN                 :
ESXI2 MIGRATION NODE IP ADDRESS           :
ESXI2 MIGRATION NODE FQDN                 :
ESXI3 MIGRATION NODE IP ADDRESS           :
ESXI3 MIGRATION NODE FQDN                 :

MAIL SENDER                              : service@nextups.eu
MAIL RECIPIENT1                          : service@nextups.eu
MAIL RECIPIENT2                          :
```

Check the UPS Status and Communication

After configuring the SNMP settings, the UPS status can be checked by using the status command. It will show the status of the PPM service and configured UPS. Also, the last 10 log entries will be shown.

Command: sudo PPM -s

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -s

NEXT UPS Systems - Power Protection Manager (PPM) for VMware vCenter Server

Service status           : Running
Service version          : v1.2.1 (build vmw-vcs.20251024)
Mail agent status        : Running

Customer tag             : NUS-EMEA

UPS1
----
UPS IP address           : 10.12.34.102
UPS status                : On line
UPS time on battery      : 00:00:00 (hh:mm:ss)
UPS battery status       : Normal
UPS battery voltage      : 40.8V
UPS battery capacity     : 100%
UPS battery remaining backup time : 15 minutes
UPS battery temperature  : 29 degrees Celsius
UPS output load          : 42%
UPS name                 : UPSTDSRVTEST02
UPS location             : TDSRV-EL7FL2
UPS technology           : LINE-INT
UPS SNMP card firmware   : 3.7.0.3
UPS serial number        : 715319800125

Last 10 logs:
-----
12-03-2025 01:36:40 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line -- no
timer activated (anymore)
12-03-2025 07:42:20 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line -- no
timer activated (anymore)
12-03-2025 07:42:26 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line -- no
timer activated (anymore)
12-03-2025 09:09:21 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line -- no
timer activated (anymore)
12-03-2025 09:09:26 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line -- no
timer activated (anymore)
13-03-2025 13:05:02 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line -- no
timer activated (anymore)
13-03-2025 13:05:23 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line -- no
timer activated (anymore)
13-03-2025 13:06:24 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line -- no
timer activated (anymore)
13-03-2025 13:06:39 - Test mail configuration
13-03-2025 13:08:00 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line -- no
timer activated (anymore)
```

4.2.3 CLUSTER ACCESS CONFIGURATION

This section covers the configuration for the access to the ESXi vCenter Server appliance, optional VSAN appliance and PPM owner node.

- **Overview of the tags and cluster access credentials**

A typical cluster environment will consist of multiple Physical Servers, each hosting a VMware ESXi. The Virtual Machines in the cluster will be managed by the VMware vCenter Server, overseeing the cluster. Optional, it is possible to enable the DRS functionality to spread the virtual machine workloads across the vSphere hosts. Note that the DRS function will always be disabled by PPM, before a migration or shutdown process is started.

On each ESXi an additional VM will host the Power Protection Manager (PPM), and an optional VM when using a VSAN (HCI storage). These two VM's should be excluded from the migration/shutdown process in case of a power failure.

In order to exclude the VMs hosting PPM (and an optional VSAN environment) from the migration process, both the **PPM Appliance Virtual Machine tag** and **VSAN Appliance Virtual Machine tag** need to be configured in PPM.

Also the **vCenter Server Appliance Virtual Machine tag** must be configured in PPM.

[IMPORTANT] The value of these tags should correspond to the exact name (! case-sensitive !) of the appropriate VM on the ESXi host.

[IMPORTANT] For correct shutdown order of the two VMs, for PPM and VSAN, the autostart order should be set on the ESXi host. Please remember that ESXi is using the opposite autostart order of those VMs to define their shutdown order. The PPM and VSAN autostart order should be set to 1 and 2, so VSAN will shut down first.

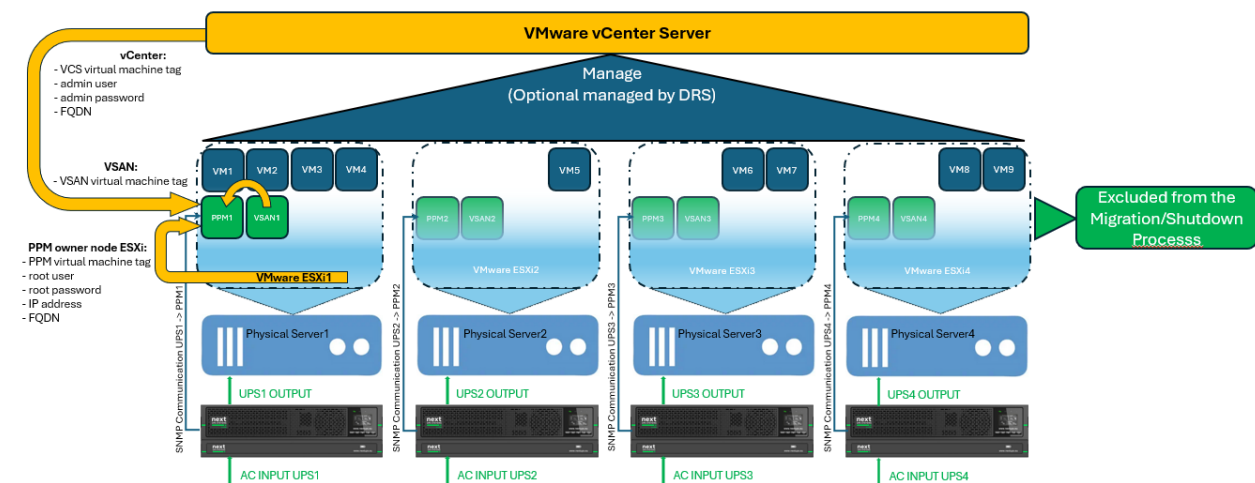
| Virtual machine | Shutdown behavior | Autostart order | Start delay | Stop delay |
|---|-------------------|-----------------|-------------|------------|
| NEXTUPS-PPM-VCS-ESXITEST01 | System default | 1 | 0 s | 120 s |
| VSAN-JDSS01 | System default | 2 | 0 s | 120 s |
| vCLS-c1374d56-2fab-7d51-3a9e-333333333333 | Not Applicable | Unset | 0 s | 120 s |
| UBU2404LTSTEST02 | Not Applicable | Unset | 0 s | 120 s |

For accessing and sending the correct migration/shutdown commands to the vCenter Server appliance, the access parameters should be set:

- **vCenter admin user**
- **vCenter admin password**
- **vCenter FQDN**

For accessing and sending the correct shutdown commands to the parent ESXi host, the access parameters should be set:

- **PPM owner node ESXi root user**
- **PPM owner node ESXi root password**
- **PPM owner node ESXi IP address**
- **PPM owner node ESXi FQDN**



Cluster Access Overview: (example with 4 nodes in a cluster)

- **Set PPM appliance virtual machine tag**

Set the PPM appliance virtual machine tag (name). This virtual machine will be excluded from the migration/shutdown process:

Command: `sudo PPM -c -u ppmvm_tag '<value>'`
Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u ppmvm_tag 'NEXTUPS-PPM-VCS-ESXITEST01'

PPM: ppmvm_tag option has been updated.
PPM: Restarting service to apply new value...
```

- **Set VSAN appliance virtual machine tag (optional)**

When using a VSAN (HCI storage) set the appliance virtual machine tag (name). This virtual machine will be excluded from the migration/shutdown process:

Command: `sudo PPM -c -u vsanvm_tag '<value>'`
Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u vsanvm_tag 'VSAN-JDSS01'

PPM: vsanvm_tag option has been updated.
PPM: Restarting service to apply new value...
```

- **Set vCenter Server appliance virtual machine tag**

Set the vCenter appliance virtual machine tag (name). When set with the virtual machine name of the vCenter appliance, this VM will receive a graceful shutdown before the last available node (hypervisor) itself shuts down:

Command: `sudo PPM -c -u vcsvm_tag '<value>'`
[IMPORTANT] Only alphanumeric and `._-` characters are allowed
Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u vcsvm_tag 'PPMVCSTEST01'

PPM: vcsvm_tag option has been updated.
PPM: Restarting service to apply new value...
```

- **Set vCenter admin user**

Set the admin username to login on the vCenter Server appliance:

Command: `sudo PPM -c -u vcs_user '<value>'`
Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u vcs_user 'administrator@vsphere.local'

PPM: vcs_user option has been updated.
PPM: Restarting service to apply new value...
```

- **Set vCenter admin password**

Set the password to login on the vCenter Server appliance:

Command: `sudo PPM -c -u vcs_pass '<value>'`
[IMPORTANT] Only alphanumeric and `!*#$&._-` characters are allowed

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u vcs_pass 'N3xt3M3A*-'
PPM: vcs_pass option has been updated.
PPM: Restarting service to apply new value...
```

- **Set vCenter FQDN**

Set the fully qualified domain name of the vCenter Server appliance:

Command: `sudo PPM -c -u vcs_fqdn '<value>'`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u vcs_fqdn 'ppmvcstest01.sxsrv.lan'
PPM: vcs_fqdn option has been updated.
PPM: Restarting service to apply new value...
```

- **Set PPM owner node ESXi root user**

Set the PPM owner node user name:

Command: `sudo PPM -c -u ppmownernodeesxi_user '<value>'`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u ppmownernodeesxi_user 'root'
PPM: ppmownernodeesxi_user option has been updated.
PPM: Restarting service to apply new value...
```

- **Set PPM owner node ESXi root password**

Set the password for the PPM owner node ESXi root user:

Command: `sudo PPM -c -u ppmownernodeesxi_pass '<value>'`

[IMPORTANT] Only alphanumeric and !*#\$%&_ - characters are allowed

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u ppmownernodeesxi_pass 'N3xt3M3A*-'
PPM: ppmownernodeesxi_pass option has been updated.
PPM: Restarting service to apply new value...
```

- **Set PPM owner node IP address**

Set the IPv4 address of the PPM owner node:

Command: `sudo PPM -c -u ppmownernode_ip '<value>'`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u ppmownernode_ip '10.12.34.31'
PPM: ppmownernode_ip option has been updated.
PPM: Restarting service to apply new value...
```

- **Set PPM owner node FQDN**

Set the fully qualified domain name of the PPM owner node:

Command: `sudo PPM -c -u ppmownernode_fqdn '<value>'`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u ppmownernode_fqdn 'ppmesxitest01.sxsrv.lan'

PPM: ppmownernode_fqdn option has been updated.
PPM: Restarting service to apply new value...
```

Check the configuration file

All settings can be checked in the configuration file or with below command:

Command: sudo PPM -c

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c

NEXT UPS Systems - Power Protection Manager (PPM) for VMware vCenter Server - v1.2.1 (build vmw-
vcs.20251024)

Configuration file:

CUSTOMER TAG                               : NUS-EMEA
SNTP TIMEZONE                             : Europe/Brussels

UPS1 IP ADDRESS                           : 10.12.34.102
UPS1 PASSWORD                             : *****
UPS2 IP ADDRESS                           : 10.12.34.103
UPS2 PASSWORD                             : *****
UPS SNMP VERSION                           : 3
UPS SNMP V2C PRIVATE COMMUNITY             : private
UPS SNMP V3 USER NAME                     : snmpuser
UPS SNMP V3 USER AUTHENTICATION PASSWORD   : snmppass
UPS SNMP V3 USER AUTHENTICATION PROTOCOL   : MD5
UPS SNMP V3 USER PRIVATE PASSWORD          : snmppass
UPS SNMP V3 USER SECURITY LEVEL             : authNoPriv

UPS NON PROTECT STATE ACTION                : donothing
UPS ON BATTERY TIMER (seconds | minutes)    : disabled
UPS MINIMUM REMAINING BACKUP TIME THRESHOLD (minutes) : disabled
UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD (%) : 30

UPS OUTLETS POWER-OFF TIMER (minutes)       : disabled
UPS OUTLETS POWER-ON TIMER (minutes)        : disabled

VM HANDLING MODE                           : migrate

PPM APPLIANCE VIRTUAL MACHINE TAG           : NEXTUPS-PPM-VCS-ESXITEST01
VSAN APPLIANCE VIRTUAL MACHINE TAG          : VSAN-JDSS01
VCENTER SERVER APPLIANCE VIRTUAL MACHINE TAG : PPMVCSTEST01

VCENTER SERVER USER                        : administrator@vsphere.local
VCENTER SERVER FQDN                        : ppmvcstest01.sxsrv.lan
VCENTER SERVER PASSWORD                     : *****

PPM OWNER NODE ESXI USER                   : root
PPM OWNER NODE IP ADDRESS                   : 10.12.34.31
PPM OWNER NODE FQDN                         : ppmesxitest01.sxsrv.lan
PPM OWNER NODE ESXI PASSWORD                : *****

ESXI1 MIGRATION NODE IP ADDRESS             :
ESXI1 MIGRATION NODE FQDN                   :
ESXI2 MIGRATION NODE IP ADDRESS             :
ESXI2 MIGRATION NODE FQDN                   :
ESXI3 MIGRATION NODE IP ADDRESS             :
ESXI3 MIGRATION NODE FQDN                   :

MAIL SENDER                                : service@nextups.eu
MAIL RECIPIENT1                             : service@nextups.eu
MAIL RECIPIENT2                             :
```

4.2.4 MIGRATION/SHUTDOWN PARAMETERS

This section covers the configuration of the parameters that will trigger a migration or shutdown process for the virtual machines in the cluster and the shutdown procedure for the ESXi host(s).

In case of a power failure and UPS working on battery power, 3 events can trigger the shutdown procedure for the configured ESXi host(s):

- **UPS ON BATTERY TIMER** (seconds/minutes) reaching a specified value
- **UPS MINIMUM REMAINING BACKUP TIME THRESHOLD** (minutes) drops below a specific value
- **UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD** (%) drops below a specific value

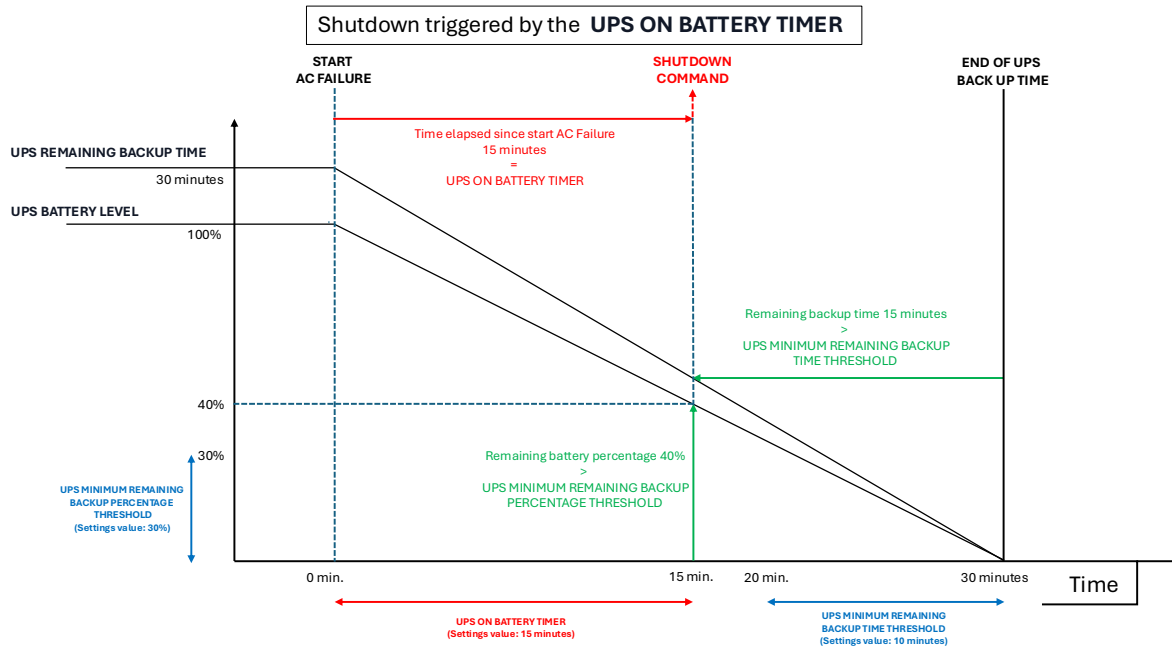
These 3 events that can trigger the shutdown procedure can be set individually in PPM; any event that occurs first will trigger the shutdown procedure to be sent to the ESXi host(s).

Default settings are that only a UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD of 30% will trigger the shutdown action. The default settings for the UPS ON BATTERY TIMER and UPS MINIMUM REMAINING BACKUP TIME THRESHOLD are blank and will not be considered.

The settings can be changed by configuring the values for these 3 parameters:

- **UPS ON BATTERY TIMER**

In case of a power failure and the UPS is working on battery power, PPM will launch a timer before sending the shutdown procedure to the ESXi host(s). The UPS ON BATTERY TIMER setting is a value in seconds (s) or minutes (m) to elapse before executing the shutdown procedure.



The timer can be set in seconds or minutes using unit 's' or 'm' in the parameter value:

Command: `sudo PPM -c -u upsonbattery_timer '<value>'`
Example: `sudo PPM -c -u upsonbattery_timer '600s'`
`sudo PPM -c -u upsonbattery_timer '10m'`

[IMPORTANT] Default setting is blank. Valid settings are numeric values with additions 's' or 'm' and blank. If set to blank (sudo PPM -c -u upsonbattery_timer ") the UPS ON BATTERY TIMER will not be considered to trigger the shutdown of the ESXi host(s).

Return Output:

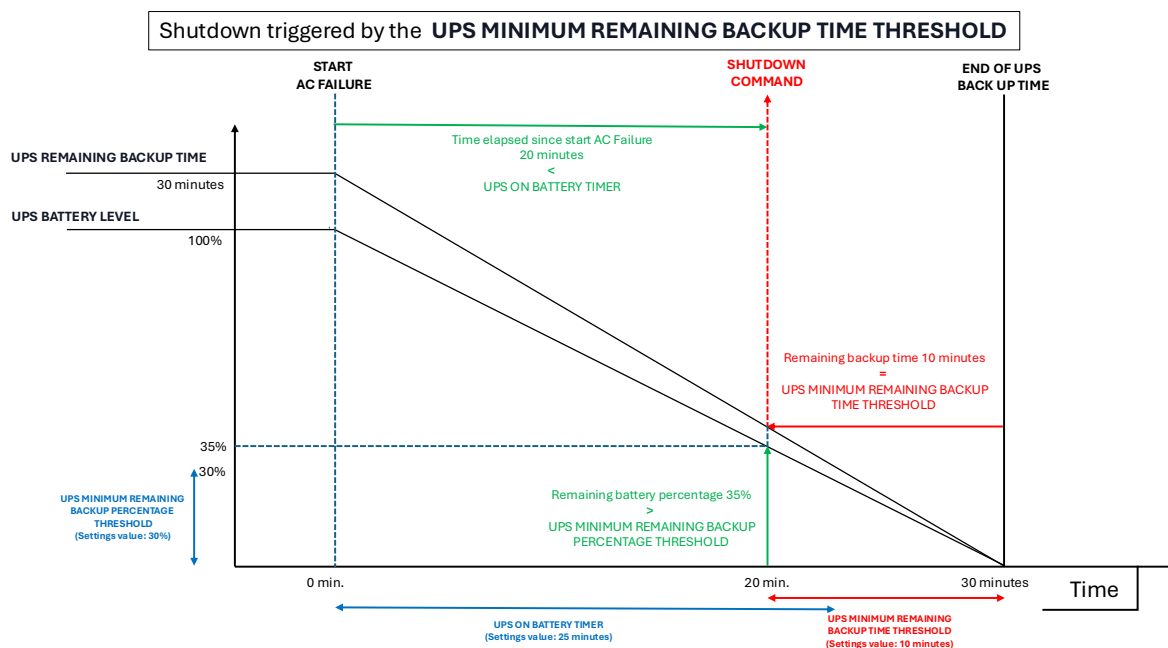
```
ppm@nextups-ppm:~$ sudo PPM -c -u upsonbattery_timer '15m'
PPM: upsonbattery_timer option has been updated.
PPM: Restarting service to apply new value...
```

• **UPS MINIMUM REMAINING BACKUP TIME THRESHOLD**

Depending on the actual load and battery level, the UPS will calculate an estimated remaining *Backup Time*. This time can be checked in the status command (sudo PPM -s) and on the **UPS network interface – UPS STATUS page**.

- If two UPSs are configured, the remaining *Backup Times* for both UPSs will be add up to compare with the configured value of the UPS MINIMUM REMAINING BACKUP TIME THRESHOLD.

The UPS MINIMUM REMAINING BACKUP TIME THRESHOLD, as set in PPM, is the minimum value for the remaining backup time before executing the shutdown procedure.



This threshold is being set in minutes (m) in the parameter value:

Command: `sudo PPM -c -u upsremaining_minutes '<value>'`

[IMPORTANT] Default setting is blank. Valid settings are numeric values and blank. If set to blank (sudo PPM -c -u upsremaining_minutes "") the UPS MINIMUM REMAINING BACKUP TIME THRESHOLD will not be considered to trigger the shutdown of the ESXi host(s).

Return Output:

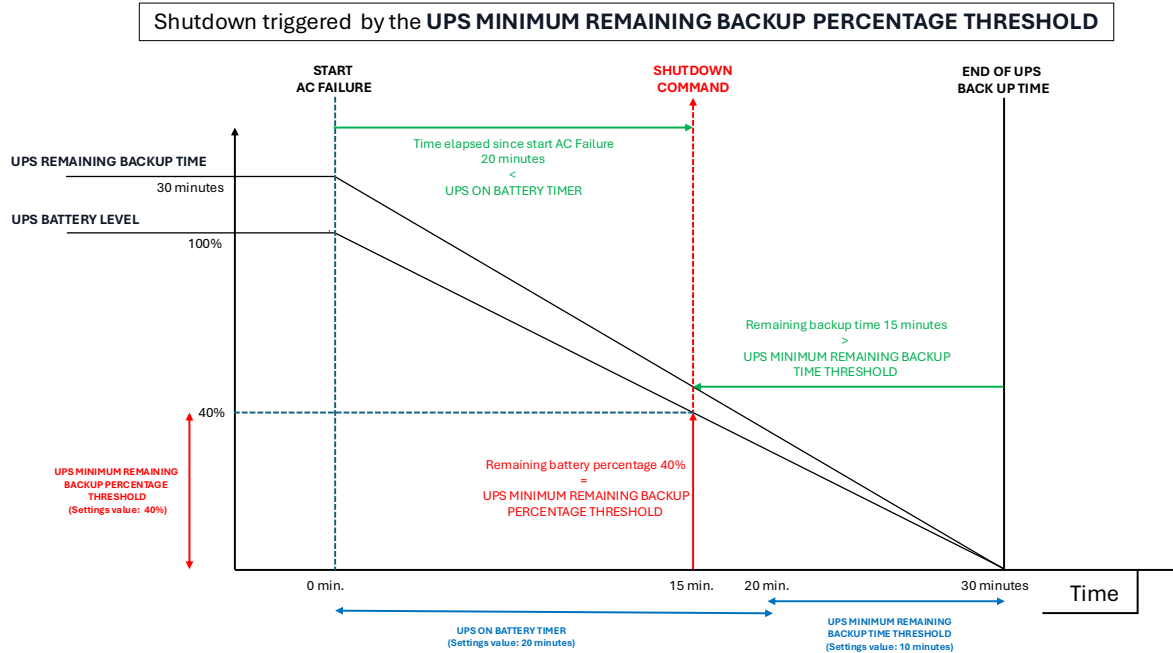
```
ppm@nextups-ppm:~$ sudo PPM -c -u upsremaining_minutes '25'
PPM: upsremaining_minutes option has been updated.
PPM: Restarting service to apply new value...
```

• **UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD**

The battery level of the UPS depends on the actual state of the battery. This battery level can be checked in the status command (sudo PPM -s) and on the **UPS network interface – UPS STATUS page**.

- If two UPSs are configured, the percentages for both will be add up to compare with the configured value of the UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD.

The UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD, as set in PPM, is the minimum value for the UPS battery level in percentage (%) before executing the shutdown procedure.



This threshold is being set in percentage (%) in the parameter value:

Command: `sudo PPM -c -u upsremaining_percentage '<value>'`

[IMPORTANT] Default setting is 30. Valid settings are numeric values from 0 to 100. This value cannot be left blank. If desired not to be used this value can be set to 0.

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upsremaining_percentage '50'
PPM: upsremaining_percentage option has been updated.
PPM: Restarting service to apply new value...
```

• **UPS NON PROTECT STATE ACTION**

[IMPORTANT]

In addition to the configuration of the shutdown procedure in case of a power failure, it is also possible to trigger the shutdown when the UPS is in a 'non protective' state. This will be the case if the UPS is in one of these states: '**Unknown**', '**Off/Standby**' or '**On Bypass**', even if the mains supply (UPS input) is still present.

In these states the UPS will not switch to battery power in case of a power failure and therefore the attached devices are not protected.

This setting can be configured through the 'upsnonprotectstate_action' parameter and can be set to:

- donothing:** PPM will not consider the non-protective state of the UPS. Only in case of a power failure and the UPS is on battery power, it launches the UPS ON BATTERY TIMER and/or checks both values for:
 - UPS MINIMUM REMAINING BACKUP TIME THRESHOLD (minutes)
 - UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD (%)
- shutdown:** In case the UPS is in a 'non protective' state, PPM will act as if the UPS is working on battery power and starts the shutdown procedure for the ESXi host(s) by launching the UPS ON BATTERY TIMER and/or checking both values for:
 - UPS MINIMUM REMAINING BACKUP TIME THRESHOLD (minutes)
 - UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD (%)

Command: `sudo PPM -c -u upsnonprotectstate_action '<value>'`

[IMPORTANT] Default setting is donothing. Valid settings are: donothing | shutdown

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upsnonprotectstate_action 'donothing'

PPM: upsnonprotectstate_action option has been updated.
PPM: Restarting service to apply new value...
```

• **UPS OUTLETS POWER OFF/ON TIMER**

After triggering the shutdown procedure, PPM can also control the UPS power outlets. This can be done to preserve the remaining battery capacity and/or auto power-on of the server(s) when AC power returns.

The UPS outlets can be controlled by configuring two timers:

- **UPS OUTLETS POWER-OFF TIMER** in minutes
- **UPS OUTLETS POWER-ON TIMER** in minutes

[IMPORTANT] Great care should be taken by setting these timers because of the risk of cutting off the power to the host prior to the complete shutdown of the VMs and the host itself.

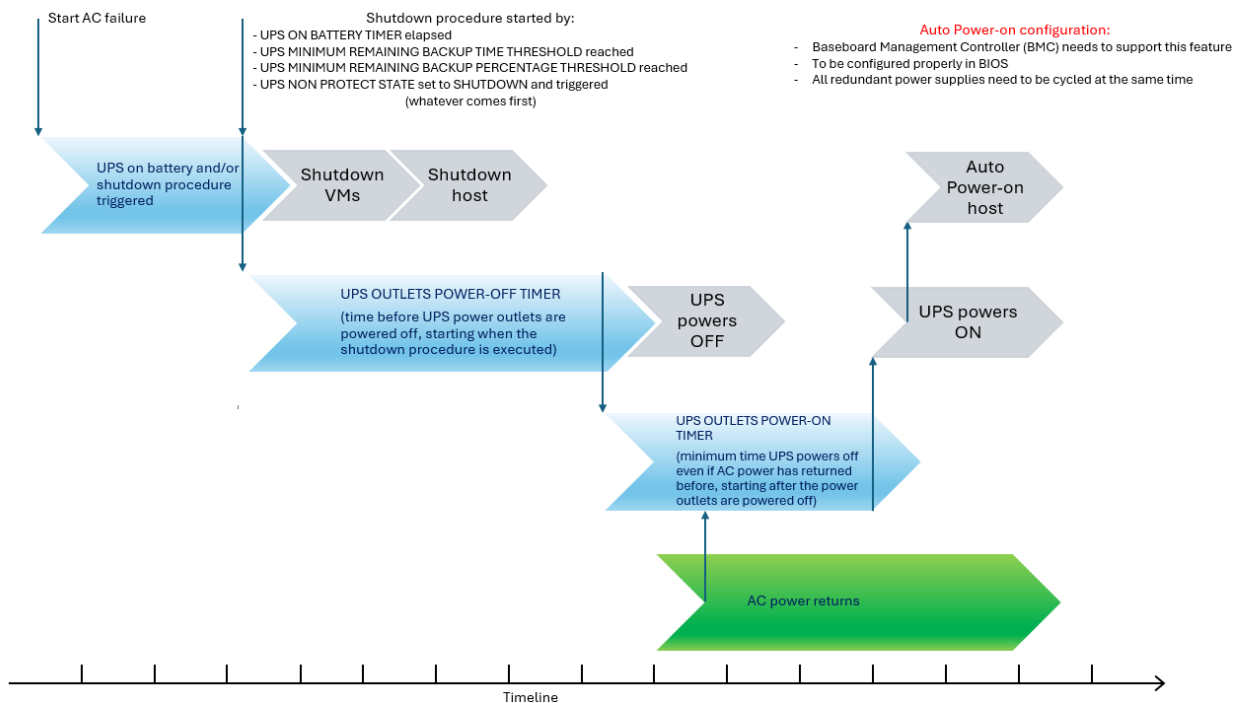
To configure these timers, the UPS root password and correct SNMP V2C/V3 settings need to be set in PPM. Otherwise, the configuration overview will show 'unavailable' at these settings.

The **UPS OUTLETS POWER-OFF TIMER** is the time in minutes to elapse before the UPS power outlets are powered off, starting when the shutdown procedure is started.

[IMPORTANT] Consider the maximum time needed for shutting down all VMs and the host itself before setting this timer, as this function will cut off the power to the host when the timer expired.

The **UPS OUTLETS POWER-ON TIMER** is the minimum time in minutes to elapse before the UPS power outlets are powered back on, starting after the power outlets are being powered off. Even if the AC power returns before this timer has elapsed, the UPS will wait the configured amount of time before power on the outlets.

The configuration of the auto power-on function must be set separately in the server BIOS and needs a Baseboard Management Controller (BMC) that supports the auto power-on. In case of multiple power supplies in the host's chassis, all power supplies need to be cycled at the same time for the auto power-on to be effective.



Set the UPS OUTLET POWER-OFF TIMER by this command:

Command: `sudo PPM -c -u upsoutlets_timeroff '<value>'`

[IMPORTANT] Default setting is disabled. Valid settings are depending on UPS technology. On-line UPSs supports values from 5 to 60, in increments of 5. Line-interactive UPSs supports values from 5 to 10, in increments of 5.

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upsoutlets_timeroff '15'
PPM: upsoutlets_timeroff option has been updated.
PPM: Restarting service to apply new value...
```

Set the UPS OUTLET POWER-ON TIMER by this command:

Command: `sudo PPM -c -u upsoutlets_timeron '<value>'`

[IMPORTANT] Default setting is disabled. Valid settings are depending on UPS technology. On-line UPSs supports values from 5 to 60, in increments of 5. Line-interactive UPSs supports values from 5 to 10, in increments of 5.

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u upsoutlets_timeron '5'
PPM: upsoutlets_timeron option has been updated.
PPM: Restarting service to apply new value...
```

• VM HANDLING MODE

Command: `sudo PPM -c -u vmhandling_mode '<value>'`

[IMPORTANT] Default setting is migrate. Valid settings are: migrate | shutdown

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u vmhandling_mode 'migrate'
PPM: vmhandling_mode option has been updated.
PPM: Restarting service to apply new value...
```

For configuration of the migrate mode see chapter 4.2.5 MIGRATION CONFIGURATION.
For configuration of the shutdown mode see chapter 4.2.6 SHUTDOWN CONFIGURATION.

Check the configuration file

All settings can be checked in the configuration file or with below command:

Command: sudo PPM -c

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c

NEXT UPS Systems - Power Protection Manager (PPM) for VMware vCenter Server - v1.2.1 (build vmw-
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Configuration file:

CUSTOMER TAG                               : NUS-EMEA
SNTP TIMEZONE                              : Europe/Brussels

UPS1 IP ADDRESS                           : 10.12.34.102
UPS1 PASSWORD                             : *****
UPS2 IP ADDRESS                           : 10.12.34.103
UPS1 PASSWORD                             : *****
UPS SNMP VERSION                          : 3
UPS SNMP V2C PRIVATE COMMUNITY             : private
UPS SNMP V3 USER NAME                     : snmpuser
UPS SNMP V3 USER AUTHENTICATION PASSWORD   : snmppass
UPS SNMP V3 USER AUTHENTICATION PROTOCOL   : MD5
UPS SNMP V3 USER PRIVATE PASSWORD         : snmppass
UPS SNMP V3 USER SECURITY LEVEL            : authNoPriv

UPS NON PROTECT STATE ACTION               : donothing
UPS ON BATTERY TIMER (seconds | minutes)   : 10s
UPS MINIMUM REMAINING BACKUP TIME THRESHOLD (minutes) : 15
UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD (%) : 30

UPS OUTLETS POWER-OFF TIMER (minutes)      : 15
UPS OUTLETS POWER-ON TIMER (minutes)       : 5

VM HANDLING MODE                           : migrate

PPM APPLIANCE VIRTUAL MACHINE TAG          : NEXTUPS-PPM-VCS-ESXITEST01
VSAN APPLIANCE VIRTUAL MACHINE TAG         : VSAN-JDSS01
VCENTER SERVER APPLIANCE VIRTUAL MACHINE TAG : PPMVCTest01

VCENTER SERVER USER                       : administrator@vsphere.local
VCENTER SERVER FQDN                       : ppmvcstest01.sxsrv.lan
VCENTER SERVER PASSWORD                   : *****

PPM OWNER NODE ESXI USER                  : root
PPM OWNER NODE IP ADDRESS                  : 10.12.34.31
PPM OWNER NODE FQDN                       : ppmesxitest01.sxsrv.lan
PPM OWNER NODE ESXI PASSWORD              : *****

ESXI1 MIGRATION NODE IP ADDRESS            :
ESXI1 MIGRATION NODE FQDN                 :
ESXI2 MIGRATION NODE IP ADDRESS            :
ESXI2 MIGRATION NODE FQDN                 :
ESXI3 MIGRATION NODE IP ADDRESS            :
ESXI3 MIGRATION NODE FQDN                 :

MAIL SENDER                               : service@nextups.eu
MAIL RECIPIENT1                           : service@nextups.eu
MAIL RECIPIENT2                           :
```

4.2.5 MIGRATION CONFIGURATION

This section covers the configuration for migrating the virtual machines in the cluster environment before shutting down the nodes powered by the specific UPS(s).

To set the PPM action to migrating the VMs, the parameter `vmhandling_mode` should be set to 'migrate':

Command: `sudo PPM -c -u vmhandling_mode 'migrate'`

[IMPORTANT] Default setting is migrate. Valid settings are: migrate | shutdown

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u vmhandling_mode 'migrate'

PPM: vmhandling_mode option has been updated.
PPM: Restarting service to apply new value...
```

- **Configuration parameters and migration process**

On each node in the cluster environment (VMware ESXi1-4), the Power Protection Manager (PPM1-4) is installed to configure the migration procedure.

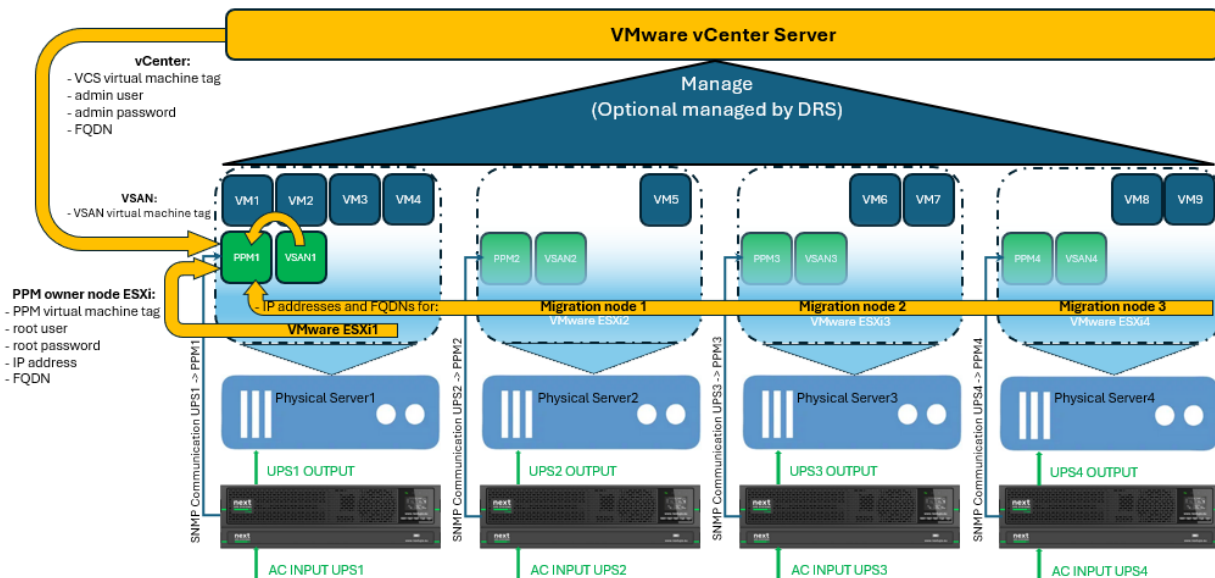
See chapter 4.2.3 CLUSTER ACCESS CONFIGURATION for configuring the tags (! case-sensitive !) for PPM, vCenter, optional VSAN and the cluster access parameters.

Up to 3 migration nodes can be configured to determine the sequence in which PPM should try to migrate the HA VMs before shutting down the ESXi host. At least one migration node is mandatory.

PPM will migrate the vCenter Server appliance VM first, before trying to migrate the active VMs on this host to the set **migration node 1**. If this node is not reachable or lack resources, PPM will try to use **migration node 2** and **migration node 3** (if configured), in this sequence. In case of insufficient resources on the last configured migration node, the active VMs still running on the ESXi host will be put in suspend mode. The vCenter Server appliance will be shut down.

[IMPORTANT] If DRS is enabled on the vCenter Server, it will be disabled before starting the migration process.

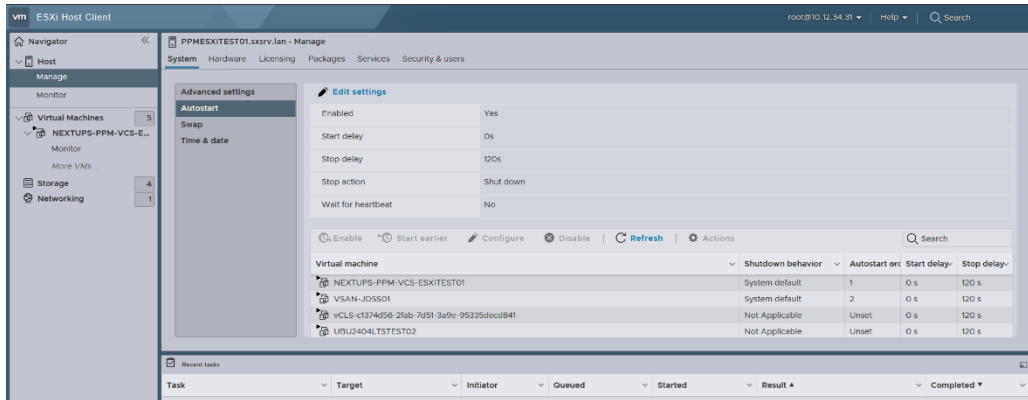
To set the preferred migration order, **ESXi1-3 migration nodes IP address** and **ESXi1-3 migration nodes FQDN** need to be configured in each PPM.



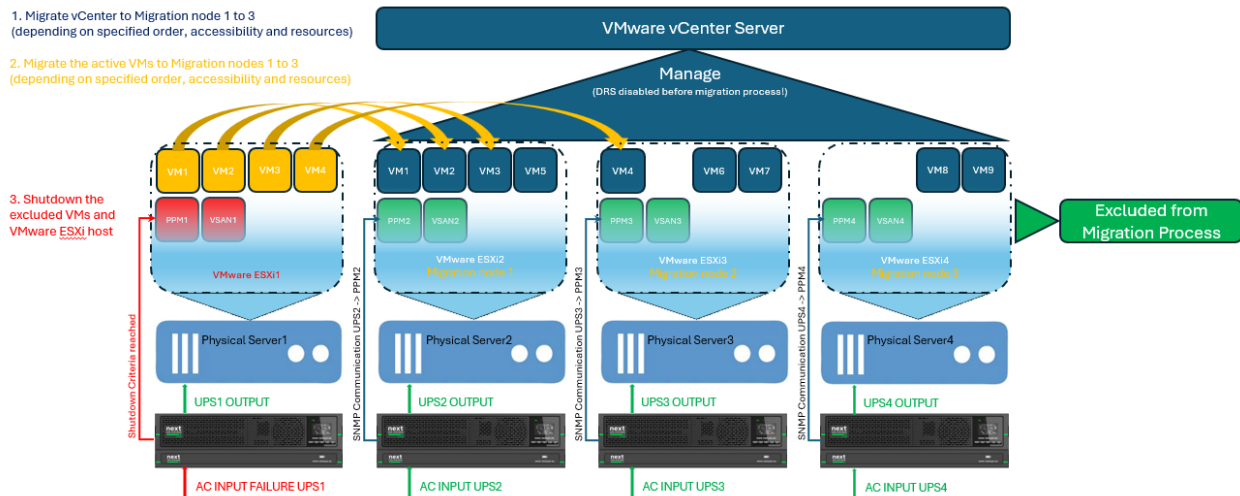
Migration parameters overview

In case of a power failure and the UPS is working on battery power, reaching one of the migration/shutdown parameters (as configured in chapter 4.2.4 MIGRATION/SHUTDOWN PARAMETERS) will start the migration process from the node powered by the UPS to the set migration nodes (excluding the VMs for PPM and VSAN).

After migrating the VMs, the remaining VSAN and PPM VMs will be shut down before a graceful shutdown of the ESXi host itself. VSAN and PPM shutdown will follow the opposite order as set in the configured ESXi autostart order:



The vCenter appliance will receive a graceful shutdown before the last available node (hypervisor) itself shuts down.



Migration process when UPS reaches migration/shutdown criteria

- **Set ESXi1-3 migration nodes IP address(es)**

Set the migration node IPv4 address(es):

Command: `sudo PPM -c -u esxi1migrationnode_ip '<value>'`
`sudo PPM -c -u esxi2migrationnode_ip '<value>'`
`sudo PPM -c -u esxi3migrationnode_ip '<value>'`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u esxi1migrationnode_ip '10.12.34.32'
PPM: esxi1migrationnode_ip option has been updated.
PPM: Restarting service to apply new value...
```

- **Set ESXi1-3 migration nodes FQDN**

Set the migration node fully qualified domain name(s):

Command: sudo PPM -c -u esxi1migrationnode_fqdn '<value>'
 sudo PPM -c -u esxi2migrationnode_fqdn '<value>'
 sudo PPM -c -u esxi3migrationnode_fqdn '<value>'

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u esxi1migrationnode_fqdn 'ppmesxitest02.sxsrv.lan'
PPM: esxi1migrationnode_fqdn option has been updated.
PPM: Restarting service to apply new value...
```

Check the configuration file

All settings can be checked in the configuration file or with below command:

Command: sudo PPM -c

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c

NEXT UPS Systems - Power Protection Manager (PPM) for VMware vCenter Server - v1.2.1 (build vmw-
vcs.20251024)

Configuration file:

CUSTOMER TAG                               : NUS-EMEA
SNTP TIMEZONE                              : Europe/Brussels

UPS1 IP ADDRESS                            : 10.12.34.102
UPS1 PASSWORD                              : *****
UPS2 IP ADDRESS                            : 10.12.34.103
UPS1 PASSWORD                              : *****
UPS SNMP VERSION                           : 3
UPS SNMP V2C PRIVATE COMMUNITY             : private
UPS SNMP V3 USER NAME                     : snmpuser
UPS SNMP V3 USER AUTHENTICATION PASSWORD   : snmppass
UPS SNMP V3 USER AUTHENTICATION PROTOCOL   : MD5
UPS SNMP V3 USER PRIVATE PASSWORD         : snmppass
UPS SNMP V3 USER SECURITY LEVEL            : authNoPriv

UPS NON PROTECT STATE ACTION                : donothing
UPS ON BATTERY TIMER (seconds | minutes)    : 10s
UPS MINIMUM REMAINING BACKUP TIME THRESHOLD (minutes) : 15
UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD (%) : 30

UPS OUTLETS POWER-OFF TIMER (minutes)       : 15
UPS OUTLETS POWER-ON TIMER (minutes)       : 5

VM HANDLING MODE                           : migrate

PPM APPLIANCE VIRTUAL MACHINE TAG          : NEXTUPS-PPM-VCS-ESXITEST01
VSAN APPLIANCE VIRTUAL MACHINE TAG         : VSAN-JDSS01
VCENTER SERVER APPLIANCE VIRTUAL MACHINE TAG : PPMVCTest01

VCENTER SERVER USER                        : administrator@vsphere.local
VCENTER SERVER FQDN                       : ppmvcstest01.sxsrv.lan
VCENTER SERVER PASSWORD                    : *****

PPM OWNER NODE ESXI USER                   : root
PPM OWNER NODE IP ADDRESS                  : 10.12.34.31
PPM OWNER NODE FQDN                       : ppmesxitest01.sxsrv.lan
PPM OWNER NODE ESXI PASSWORD              : *****

ESXI1 MIGRATION NODE IP ADDRESS            : 10.12.34.32
ESXI1 MIGRATION NODE FQDN                 : ppmesxitest02.sxsrv.lan
ESXI2 MIGRATION NODE IP ADDRESS            : 10.12.34.33
ESXI2 MIGRATION NODE FQDN                 : ppmesxitest03.sxsrv.lan
ESXI3 MIGRATION NODE IP ADDRESS            : 10.12.34.34
ESXI3 MIGRATION NODE FQDN                 : ppmesxitest04.sxsrv.lan

MAIL SENDER                               : service@nextups.eu
MAIL RECIPIENT1                           : service@nextups.eu
MAIL RECIPIENT2                           :
```

4.2.6 SHUTDOWN CONFIGURATION

This section covers the configuration for shutting down the virtual machines in the cluster environment before shutting down the nodes powered by the specific UPS(s).

To set the PPM action to shutting down the VMs instead of migrating, the parameter `vmhandling_mode` should be set to 'shutdown':

Command: `sudo PPM -c -u vmhandling_mode 'shutdown'`

[IMPORTANT] Default setting is migrate. Valid settings are: migrate | shutdown

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u vmhandling_mode 'shutdown'

PPM: vmhandling_mode option has been updated.
PPM: Restarting service to apply new value...
```

After setting the **VM handling mode** to 'shutdown', PPM will automatically create a Tag Category '**PPM-VM-HANDLING-SHUTDOWN-PRIORITY**' with 5 tags in the vCenter Server:

- **VM-HANDLING-SHUTDOWN-PRIO-1** -> VM Handling Shutdown Priority Group 1
- **VM-HANDLING-SHUTDOWN-PRIO-2** -> VM Handling Shutdown Priority Group 2
- **VM-HANDLING-SHUTDOWN-PRIO-3** -> VM Handling Shutdown Priority Group 3
- **VM-HANDLING-SHUTDOWN-PRIO-4** -> VM Handling Shutdown Priority Group 4
- **VM-HANDLING-SHUTDOWN-PRIO-5** -> VM Handling Shutdown Priority Group 5

| Tag Name | Category | Description |
|-----------------------------|-----------------------------------|---------------------------------------|
| VM-HANDLING-SHUTDOWN-PRIO-1 | PPM-VM-HANDLING-SHUTDOWN-PRIORITY | VM Handling Shutdown Priority Group 1 |
| VM-HANDLING-SHUTDOWN-PRIO-2 | PPM-VM-HANDLING-SHUTDOWN-PRIORITY | VM Handling Shutdown Priority Group 2 |
| VM-HANDLING-SHUTDOWN-PRIO-3 | PPM-VM-HANDLING-SHUTDOWN-PRIORITY | VM Handling Shutdown Priority Group 3 |
| VM-HANDLING-SHUTDOWN-PRIO-4 | PPM-VM-HANDLING-SHUTDOWN-PRIORITY | VM Handling Shutdown Priority Group 4 |
| VM-HANDLING-SHUTDOWN-PRIO-5 | PPM-VM-HANDLING-SHUTDOWN-PRIORITY | VM Handling Shutdown Priority Group 5 |

These tags can be used to configure the shutdown sequence order for the VMs running on the ESXi host. To configure the shutdown sequence order, these tags should be assigned to the different VMs on the ESXi host.

PPM will shut down the VMs in order of the assigned tags VM-HANDLING-SHUTDOWN-PRIO groups 1 to 5, starting with group 1.

- **Configuration parameters and shutdown process**

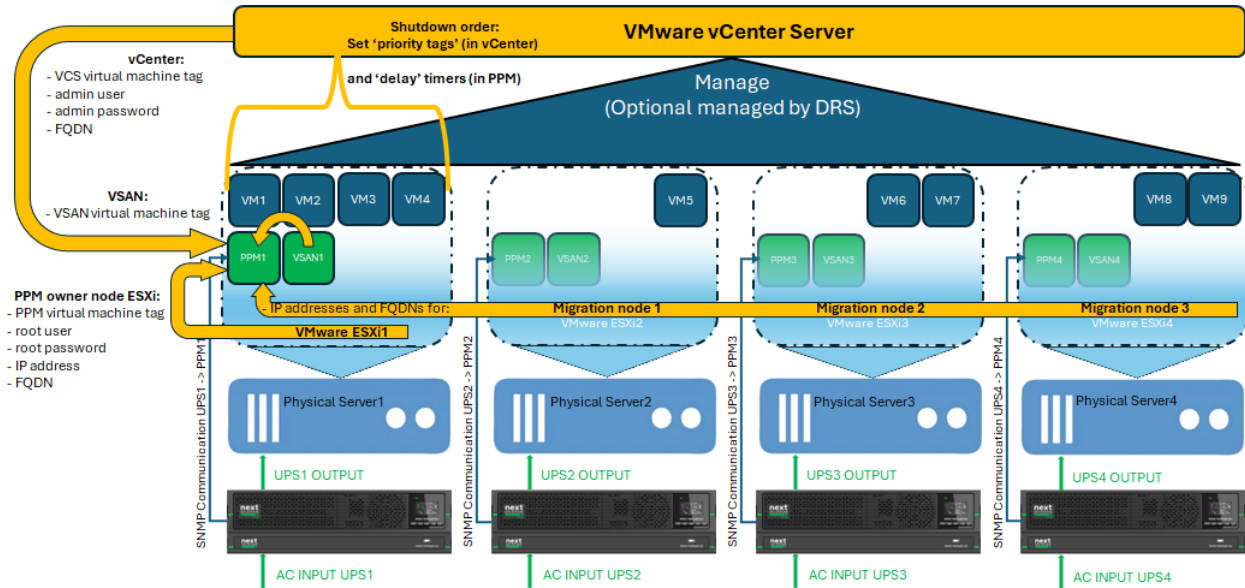
On each node in the cluster environment (VMware ESXi1-4), the Power Protection Manager (PPM1-4) is installed to configure the shutdown procedure.

See chapter 4.2.3 CLUSTER ACCESS CONFIGURATION for configuring the tags (! case-sensitive !) for PPM, vCenter, optional VSAN and the cluster access parameters.

To set the preferred migration order for the vCenter Server appliance, which PPM will try to migrate first, **ESXi1-3 migration nodes IP address** and **ESXi1-3 migration nodes FQDN** need to be configured in each PPM, see chapter 4.2.5 MIGRATION CONFIGURATION.

PPM will shut down VMs (excluding PPM, vCenter and optional VSAN) in order of the assigned tags VM-HANDLING-SHUTDOWN-PRIO groups 1 to 5, starting with group 1.

Before proceeding to the next group, PPM will wait the time as set in the **VM handling shutdown priority group 1 - 4 delay parameter**.



Shutdown parameters overview

In case of a power failure and the UPS is working on battery power, reaching one of the migration/shutdown parameters as configured in chapter 4.2.4 MIGRATION/ SHUTDOWN CONFIGURATION, the PPM powered by this UPS will start a shutdown process of the virtual machines running on this node.

[IMPORTANT] If DRS is enabled on the vCenter Server, PPM will disable this functionality before starting a controlled shutdown process.

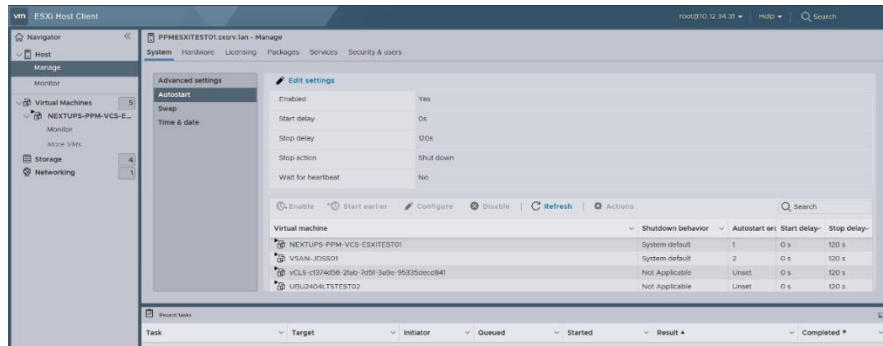
PPM will try to migrate the vCenter Server appliance VM first, before shutting down the other VMs. The vCenter Server appliance will only receive a graceful shutdown when no other migration node is available (or no migration node is configured).

Shutdown of the actual VMs running on this node will start in order of the assigned VM-HANDLING-SHUTDOWN-PRIO group tags.

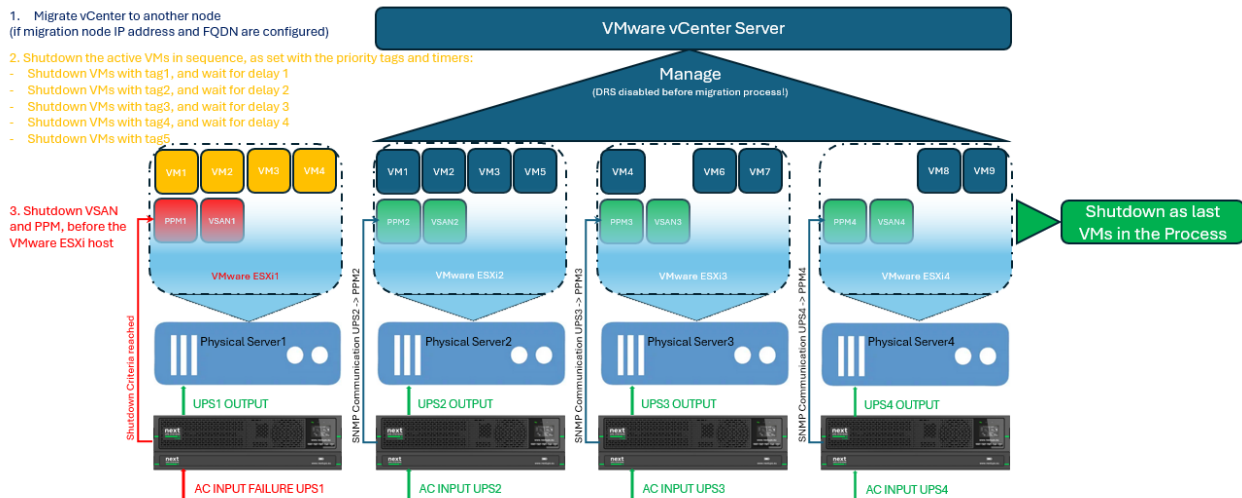
If no VMs of a particular group is running on this node, PPM will proceed with the next group without waiting for the related delay to expire:

- Start shutdown VMs with assigned tag 'VM Handling Shutdown Priority Group 1'
- Wait for timer 'VM HANDLING SHUTDOWN PRIORITY GROUP 1 DELAY' to expire (if any VMs in group)
- Shutdown VMs with assigned tag 'VM Handling Shutdown Priority Group 2'
- Wait for timer 'VM HANDLING SHUTDOWN PRIORITY GROUP 2 DELAY' to expire (if any VMs in group)
- Shutdown VMs with assigned tag 'VM Handling Shutdown Priority Group 3'
- Wait for timer 'VM HANDLING SHUTDOWN PRIORITY GROUP 3 DELAY' to expire (if any VMs in group)
- Shutdown VMs with assigned tag 'VM Handling Shutdown Priority Group 4'
- Wait for timer 'VM HANDLING SHUTDOWN PRIORITY GROUP 4 DELAY' to expire (if any VMs in group)
- Shutdown VMs with assigned tag 'VM Handling Shutdown Priority Group 5'

After shutting down the VMs, the remaining VSAN and PPM VMs will be shut down before a graceful shutdown of the ESXi host itself. VSAN and PPM shutdown will follow the opposite order as set in the configured ESXi autostart order:



The vCenter appliance will receive a graceful shutdown before the last available node (hypervisor) itself shuts down.



Shutdown process when UPS reaches migration/shutdown criteria

- **Set VM handling shutdown priority group delay 1-4**

If no value is configured for the delay, 60 seconds will be used as a default value before proceeding to the next group. Set the VM handling shutdown priority group delay 1-4:

Command:

```
sudo PPM -c -u vmhandlingshutdownpriogroup1_delay '<value>'
sudo PPM -c -u vmhandlingshutdownpriogroup2_delay '<value>'
sudo PPM -c -u vmhandlingshutdownpriogroup3_delay '<value>'
sudo PPM -c -u vmhandlingshutdownpriogroup4_delay '<value>'
```

[IMPORTANT] Default setting is not set. Valid settings are: 0 to 9999 (seconds)

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -u vmhandlingshutdownpriogroup1_delay '120'
PPM: vmhandlingshutdownpriogroup1_delay option has been updated.
PPM: Restarting service to apply new value...
```

Check the configuration file

All settings can be checked in the configuration file or with below command:

Command: sudo PPM -c

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c

NEXT UPS Systems - Power Protection Manager (PPM) for VMware vCenter Server - v1.2.1 (build vmw-
vcs.20251024)

Configuration file:

CUSTOMER TAG                               : NUS-EMEA
SNTP TIMEZONE                              : Europe/Brussels

UPS1 IP ADDRESS                           : 10.12.34.102
UPS1 PASSWORD                             : *****
UPS2 IP ADDRESS                           : 10.12.34.103
UPS1 PASSWORD                             : *****
UPS SNMP VERSION                          : 3
UPS SNMP V2C PRIVATE COMMUNITY             : private
UPS SNMP V3 USER NAME                     : snmpuser
UPS SNMP V3 USER AUTHENTICATION PASSWORD   : snmppass
UPS SNMP V3 USER AUTHENTICATION PROTOCOL   : MD5
UPS SNMP V3 USER PRIVATE PASSWORD         : snmppass
UPS SNMP V3 USER SECURITY LEVEL            : authNoPriv

UPS NON PROTECT STATE ACTION                : donothing
UPS ON BATTERY TIMER (seconds | minutes)    : 10s
UPS MINIMUM REMAINING BACKUP TIME THRESHOLD (minutes) : 15
UPS MINIMUM REMAINING BACKUP PERCENTAGE THRESHOLD (%) : 30

UPS OUTLETS POWER-OFF TIMER (minutes)       : 15
UPS OUTLETS POWER-ON TIMER (minutes)        : 5

VM HANDLING MODE                           : shutdown

VM HANDLING SHUTDOWN PRIORITY GROUP 1 DELAY (seconds) : 120
VM HANDLING SHUTDOWN PRIORITY GROUP 2 DELAY (seconds) : default (60)
VM HANDLING SHUTDOWN PRIORITY GROUP 3 DELAY (seconds) : default (60)
VM HANDLING SHUTDOWN PRIORITY GROUP 4 DELAY (seconds) : default (60)

PPM APPLIANCE VIRTUAL MACHINE TAG          : NEXTUPS-PPM-VCS-ESXITEST01
VSAN APPLIANCE VIRTUAL MACHINE TAG         : VSAN-JDSS01
VCENTER SERVER APPLIANCE VIRTUAL MACHINE TAG : PPMVCSTEST01

VCENTER SERVER USER                       : administrator@vsphere.local
VCENTER SERVER FQDN                       : ppmvcstest01.sxsrv.lan
VCENTER SERVER PASSWORD                   : *****

PPM OWNER NODE ESXI USER                  : root
PPM OWNER NODE IP ADDRESS                 : 10.12.34.31
PPM OWNER NODE FQDN                       : ppmesxitest01.sxsrv.lan
PPM OWNER NODE ESXI PASSWORD              : *****

ESXI1 MIGRATION NODE IP ADDRESS           : 10.12.34.32
ESXI1 MIGRATION NODE FQDN                 : ppmesxitest02.sxsrv.lan
ESXI2 MIGRATION NODE IP ADDRESS           : 10.12.34.33
ESXI2 MIGRATION NODE FQDN                 : ppmesxitest03.sxsrv.lan
ESXI3 MIGRATION NODE IP ADDRESS           : 10.12.34.34
ESXI3 MIGRATION NODE FQDN                 : ppmesxitest04.sxsrv.lan

MAIL SENDER                              : service@nextups.eu
MAIL RECIPIENT1                          : service@nextups.eu
MAIL RECIPIENT2                          :
```

4.3 STATUS

After configuring the PPM and SNMP settings, the service and UPS status can be checked by using the status command. It will show the status of the PPM service, and actual values for the monitored parameters of the configured UPSs.

Also, the last 10 log entries will be shown.

Command: sudo PPM -s

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -s

NEXT UPS Systems - Power Protection Manager (PPM) for VMware vCenter Server

Service status      : Running
Service version     : v1.2.1 (build vmw-vcs.20251024)
Mail agent status   : Running

Customer tag        : NUS-EMEA

UPS1
----
UPS IP address      : 10.12.34.102
UPS status          : On Line
UPS time on battery : 00:00:00 (hh:mm:ss)
UPS battery status  : Normal
UPS battery voltage : 40.8V
UPS battery capacity : 100%
UPS battery remaining backup time : 15 minutes
UPS battery temperature : 29 degrees Celsius
UPS output load     : 42%
UPS name            : UPSTDSRVTEST02
UPS location        : TDSRV-EL7FL2
UPS technology      : LINE-INT
UPS SNMP card firmware : 3.7.0.3
UPS serial number   : 715319800125

UPS2
----
UPS IP address      : 10.12.34.103
UPS status          : On Line
UPS time on battery : 00:00:00 (hh:mm:ss)
UPS battery status  : Normal
UPS battery voltage : 39.0V
UPS battery capacity : 100%
UPS battery remaining backup time : 999 minutes
UPS battery temperature : 30 degrees Celsius
UPS output load     : 0%
UPS name            : UPSTDSRVTEST01
UPS location        : TDSRV-EL7FL2
UPS technology      : ON-LINE
UPS SNMP card firmware : 3.7.0.3
UPS serial number   : CPEXN1686200018

Last 10 logs:
-----
12-03-2025 01:36:40 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" and UPS
"UPSTDSRVTEST01" with IP "10.12.34.103" is On Line -- no timer activated (anymore)
12-03-2025 07:42:20 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line and UPS
"UPSTDSRVTEST01" with IP "10.12.34.103" is Not Detected -- no timer activated (anymore)
12-03-2025 07:42:26 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" and UPS
"UPSTDSRVTEST01" with IP "10.12.34.103" is On Line -- no timer activated (anymore)
12-03-2025 09:09:21 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" is On Line and UPS
"UPSTDSRVTEST01" with IP "10.12.34.103" is Not Detected -- no timer activated (anymore)
12-03-2025 09:09:26 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" and UPS
"UPSTDSRVTEST01" with IP "10.12.34.103" is On Line -- no timer activated (anymore)
13-03-2025 13:05:02 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" and UPS
"UPSTDSRVTEST01" with IP "10.12.34.103" is On Line -- no timer activated (anymore)
13-03-2025 13:05:23 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" and UPS
"UPSTDSRVTEST01" with IP "10.12.34.103" is On Line -- no timer activated (anymore)
13-03-2025 13:06:24 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" and UPS
"UPSTDSRVTEST01" with IP "10.12.34.103" is On Line -- no timer activated (anymore)
13-03-2025 13:06:39 - Test mail configuration
13-03-2025 13:08:00 - The status of UPS "UPSTDSRVTEST02" with IP "10.12.34.102" and UPS
"UPSTDSRVTEST01" with IP "10.12.34.103" is On Line -- no timer activated (anymore)
```

4.3.1 PPM Service status values

| | |
|-------------------|---|
| Service status | : shows the status of the PPM Service: 'Running' or 'Not running' |
| Service version | : version of the PPM service |
| Mail agent status | : shows the status of the mail agent |
| Customer tag | : the customer tag (PPM name) as set in the PPM configuration. This is a variable to identify (name) your configuration. It will be used in the configuration files and in the subject field for mail communication |

4.3.2 UPS status values

| | |
|-----------------------------------|---|
| UPS IP address | : IP address of the monitored UPS. Can be set in the UPS configuration |
| UPS status | : shows the status/output of the monitored UPS. Depending on the UPS technology this can be: <ul style="list-style-type: none"> - On Line - On Bypass - Boosting - Reducing - Off/Standby - On battery - Unknown |
| UPS time on battery | : time the UPS is working on battery power |
| UPS battery status | : status of the UPS battery |
| UPS battery voltage | : actual battery voltage of the UPS battery |
| UPS battery capacity | : actual battery percentage of the UPS battery |
| UPS battery remaining backup time | : remaining backup time, calculated by the UPS depending on load and battery level |
| UPS battery temperature | : actual UPS temperature |
| UPS output load | : actual load of the UPS in percentage of its maximum |
| UPS name | : UPS description as defined in the UPS network card |
| UPS location | : UPS location as defined in the UPS network card |
| UPS technology | : type of UPS, ON-LINE or LINE-INTERACTIVE |
| UPS SNMP card firmware | : shows the FW version of the network card in the UPS |
| UPS serial number | : shows the Serial no of the monitored UPS |

4.3.3 PPM Service commands

The PPM service can be started (-S), restarted (-R) or stopped (-K):

Commands: `sudo PPM -S`
 `sudo PPM -R`
 `sudo PPM -K`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -R
PPM has restarted.
```


4.4 LOGS

PPM will log all events (status changes) from the UPSs and events from the PPM service into a log file. This log can be checked in the console or exported into a text file.

4.4.1 Display all logs

To view all log entries the `sudo PPM -l` command can be used:

Command: `sudo PPM -l`
Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -l
There are no available logs.
```

If no logs are available it will state 'There are no available logs', otherwise it will list all log entries stored in the log file.

4.4.2 Clear logs

To clear all log entries the `sudo PPM -l -c` command can be used:

Command: `sudo PPM -l -c`
Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -l -c
Logs have been cleared.
```

4.4.3 Export log file

For backup or evaluation purposes the log entries are saved in a log file. This log file can be exported as a text file. The file 'ppm_log_export' will be placed in the '/home/ppm/' directory and with the use of an SCP client (e.g. WinSCP), it can be transferred to your local device for reviewing.

Command: `sudo PPM -l -e`
Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -l -e
PPM: Logs have been exported. A file called 'ppm_log_export' is placed in
'/home/ppm/' directory.
```

4.5 EXPORT/IMPORT CONFIG FILE

All configuration settings for PPM, UPS, ESXi and shutdown parameters can be exported to a configuration file.

4.5.1 EXPORT

For backup or editing purposes it is possible to export the configuration settings as a text file. The file 'ppm_config_export' will be placed in '/home/ppm/' directory and with the use of an SCP client (e.g. WinSCP), it can be transferred to your local device.

Command: `sudo PPM -c -e`
Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -e

PPM: Configuration has been exported. A file called 'ppm_config_export' is
placed in '/home/ppm/' directory.
```

Example of a
ppm_config_export file:

```
# Customer tag (name)
CUSTAG="NUS-EMEA"

# SNMP timezone
TIMEZONE="Europe/Brussels"

# Path to script
UPSONBATTERYTIMERSSCRIPT="/opt/ppm/scripts/upsonbatterytimershutdownVCS.sh"
UPSBATTCRITMINREMAINSRIPT="/opt/ppm/scripts/upsbattcritminremainsshutdownVCS.sh"
UPSBATTCRITPCNTSCRIPT="/opt/ppm/scripts/upsbattcritpcntshutdownVCS.sh"

# Value in seconds (s)
POLLINGINTERVAL="5s"

# UPS1 IP address (IPv4)
UPS1IP="10.12.34.102"

# UPS2 IP address (IPv4)
UPS2IP="10.12.34.103"

# UPS SNMP version
UPSSNMPVERSION="3"

# UPS SNMP v2c private community
UPSSNMPV2CCOMMUNITY="private"

# UPS SNMP v3 authentication
UPSSNMPV3USER="snmpuser"
UPSSNMPV3USERAUTHPASS="snmppass"
UPSSNMPV3USERAUTHPROTOCOL="MD5"
UPSSNMPV3USERPRIVPASS="snmppass"
UPSSNMPV3USERPRIVPROTOCOL=""
UPSSNMPV3USERSECLEVEL="authNoPriv"

# Action when UPS state Unknown, Off/Standby or On Bypass
UPSONPROTECTSTATEACTION="doNothing"

# Value in seconds (s) or minutes (m)
UPSONBATTERYTIMER="10s"

# Value in minutes (m)
UPSBATTCRITMINREMAIN="15"
UPSONLINEPOWEROUTLETSCONTROFFTIMER="15"
UPSONLINEPOWEROUTLETSCONTROLONTIMER="5"
UPSLINEINTPOWEROUTLETSCONTROFFTIMER=""
UPSLINEINTPOWEROUTLETSCONTROLONTIMER=""

# Value in percentage
UPSBATTCRITPCNT="30"

# Virtual machine handling mode
VMHANDLINGMODE="migrate"

# Virtual machine shutdown delay (in seconds) between tag priority groups
VMHANDLINGSHUTDOWNDELAYTAGPRIORGROUP1=""
VMHANDLINGSHUTDOWNDELAYTAGPRIORGROUP2=""
VMHANDLINGSHUTDOWNDELAYTAGPRIORGROUP3=""
VMHANDLINGSHUTDOWNDELAYTAGPRIORGROUP4=""

# PPM appliance virtual machine tag (name)
PPMAPPTAG="NEXTUPS-PPM-VCS-ESXITEST01"

# VSAN appliance virtual machine tag (name)
VSANAPPTAG="VSAN-JDSS01"

# VCENTER SERVER appliance virtual machine tag (name)
VCSAPPTAG="PPMVCSTEST01"

# VCENTER SERVER admin user
VCSUSER="administrator@vsphere.local"

# VCENTER SERVER FQDN
VCSFQDN="ppmvcstest01.sxrv.lan"

# PPM owner node ESXi root user
PPMOWNERNODEESXIUSER="root"

# ESXi IP addresses (IPv4)
PPMOWNERNODEIP="10.12.34.31"
ESXI1MIGNODEIP="10.12.34.32"
ESXI2MIGNODEIP="10.12.34.33"
ESXI3MIGNODEIP="10.12.34.34"

# ESXi FQDN
PPMOWNERNODEFQDN="ppmesxitest01.sxrv.lan"
ESXI1MIGNODEFQDN="ppmesxitest02.sxrv.lan"
ESXI2MIGNODEFQDN="ppmesxitest03.sxrv.lan"
ESXI3MIGNODEFQDN="ppmesxitest04.sxrv.lan"

# Alert mail sender
MAILSENDER="service@nextups.eu"

# Alert mail recipients
MAILRECIPIENT1="service@nextups.eu"
MAILRECIPIENT2=""
```

4.5.2 IMPORT

With the use of an SCP client (e.g. WinSCP) a saved configuration file can be transferred from your local device to the '/home/ppm/' directory and reloaded to the PPM service.

[IMPORTANT] Great care in the syntax and layout of the config file must be taken to ensure a good function of the PPM service

Command: `sudo PPM -c -i '/home/ppm/new_ppm_config_file'`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM -c -i '/home/ppm/new_ppm_config_file'
PPM: Restarting service to apply new value...
```

5. Release notes

Release notes for the Power Protection Manager (PPM) for VMware vCenter Server - Software:

| Date | Changes | Version No | Build version |
|------------|--|------------|------------------------|
| 22/03/2025 | Initial release | 1.0 | build vmw-vcs.20250322 |
| 01/07/2025 | Add UPS power outlets control option | 1.1 | build vmw-vcs.20250625 |
| 01/08/2025 | Add virtual machine handling mode option | 1.2 | build vmw-vcs.20250717 |
| 27/10/2025 | Cosmetic enhancements | 1.2.1 | build vmw-vcs.20251024 |
| | | | |

The software release notes and changes can be checked with the following command:

Command: `sudo PPM --release-notes`

Return Output:

```
ppm@nextups-ppm:~$ sudo PPM --release-notes
Release notes:
-----
v1.0 - build vmw-vcs.20250322 - Initial release
v1.1 - build vmw-vcs.20250625 - Add power outlets control option
v1.2 - build vmw-vcs.20250717 - Add virtual machine handling mode option
v1.2.1 - build vmw-vcs.20251024 - Cosmetic enhancements
```

Release notes for the Power Protection Manager (PPM) for VMware vCenter Server - Manual:

| Date | Changes | Version No |
|------------|---|------------|
| 31/03/2025 | First draft PPM-VCS manual | 1.01 |
| 05/05/2025 | Steps for installation adapted to vCenter environment | 1.02 |
| 16/05/2025 | Layout enhancement and corrected typos | 1.03 |
| 01/07/2025 | Add UPS power outlets control option | 1.04 |
| 01/08/2025 | Add virtual machine handling mode option | 1.05 |
| 27/10/2025 | Cosmetic enhancements | 1.06 |
| | | |