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1 EATON Network Solution

1.1 Overview

Network Solution:
- provides information on events concerning the supply of power to the computers connected to your computer network,
- carries out automatic shutdown of computer systems,
- monitors and controls all the UPSs connected to the network.

As illustrated in the picture below, Network Solution provides these 3 main functions:
- connecting the UPS to the Network,
- protecting the computers,
- monitoring the UPSs over the Network.
Connecting the UPS to the Network

This function can be performed either through network Cards inserted in the UPS (Network Management Card) or through a software "agent" running on a nearby PC that is called the Network Management Proxy.

Note that the Network Management Proxy is available only on Windows.

The Network Management Card or Proxy:
- manages communication with the UPS (as well as local protection of the machine on which Proxy is installed),
- periodically accesses the information concerning the UPS,
- makes this information available to the connected applications (Network Shutdown Modules, Web Browser, Network Management Systems, Enterprise Power Manager).

Protecting the computers / servers

This function is performed by the Network Shutdown Module installed on each of the servers to be protected. Note that the Shutdown Module is available on several Operating Systems.

The Shutdown modules:
- continuously wait for information from the Mgt. Proxy or Mgt. Card connected to the EATON UPS.
- warns administrators and users if AC power fails and proceeds with graceful system shutdown before the end of battery backup power is reached.

Monitoring the UPSs over the network

Depending on your needs, you can either use:
- your Internet browser to monitor each UPS, as Management Proxy and Management Card include a Web server.
- your company's standard Network Management System (HP-Openview, CA Unicenter, HP Insight Manager, IBM Tivoli Netview). To simplify integration of EATON UPS with these NMS, you can use one of the Network Management System Kits for EATON devices. These kits are available on Management Pac 2 CD-Rom (ref 66923)
- the EATON supervisor " Enterprise Power Manager "

Notes:
- Notifications to the selected UPS events can be received via e-mail or via one of the above-mentioned software.
- The Network Management Card is used to control UPS starting and stopping via web browser.

Discover how to set up a distributed architecture using these components.
1.2 Select architecture

Below are two software and hardware architectures showing how EATON UPS can protect several computers. These typical examples using a Network Management Proxy, a Network Management Card and several Network Shutdown Modules are intended to assist you in designing your own architecture.

First of all, your EATON UPS must be directly connected to a communication Card (Network Management Card) or to a Network Management Proxy.

The Management Card and the Management Proxy are not connected in the same way, as illustrated in the diagrams below.

The diagram below shows you how to connect the Network Management Card:

Note in the diagram above that two types of connection are required for correct operation of the embedded agent (the Network Management Card is installed in the UPS):

- the electrical power cables,
- the TCP/IP communication network.

The diagram below shows you how to connect the Network Management Proxy:

Note in the diagram above that three types of connection are required for correct operation of the Management Proxy:
• a point-to-point link (serial or USB),
• the electrical power cables,
• the TCP/IP communication network.

1.3 Performance

**Network Management Proxy**, installed on a dedicated server with 512 MB Ram + CPU 2 GHz, is designed to support a maximum of:
• 250 Network Shutdown Module connections in standard secure mode

1.4 Connexion

Before connecting the UPS, you must first decide on a software and hardware architecture. Before installing the EATON Network Solution, the UPS must be set up as indicated in the steps below.
• Shut down the computers to be protected by the UPS.
• Connect the UPS to a wall outlet. (For UPSs above 3kVA, please refer to the UPS installation manual)
• Connect the power cord of each computer to an outlet on the UPS. (For UPSs above 3kVA, please refer to the UPS installation manual)
• How to connect UPS / agent / network :
  ▪ If a software agent is used (the Mgt. Proxy), connect the serial or USB port on the computer to that on the UPS using the cable supplied with the UPS.
  ▪ If an Network Management Card is used, insert the optional card in the UPS and connect the UPS to the computer network.
• Start the EATON UPS, then the computers.

Setting up the protection
• If a software agent is used (the Mgt. Proxy), install the **Mgt. Proxy** on the one machine directly connected to the UPS.
• If an Network Management Card is used, it must be set up (see the Mgt. Card's user manual).
• Install Network Shutdown Module on all the other machines that are to be protected by the UPS (supplied with UPS battery backup power).
Note: The software agent (the Mgt. Proxy) manages protection of the machine on which it is installed.
2 Installation

2.1 Compatibility


Note: If you use Windows Vista Home
To be able to function, Network Management Proxy requires to open the following ports of the Windows Firewall:
- 80 (HTTP) and 443 (HTTPS) ports (Network connection Settings of the Advanced section).
- 4680 TCP port (Use by the clients during connection with NMP).
- 137 UDP port (File and Printer Sharing of the Exceptions section) to use the export log function.

2.2 Installation options

I) If you use the Microsoft Web server (IIS)

If the Microsoft Web server (IIS) is not installed on your server or if you don't use the IIS Web functionality, please don't care the following information.

To be able to function, Network Management Proxy requires the use of a Web server. It provides its dedicated Web server that uses the ports 80 (HTTP) and 443 (HTTPS).
By default, these ports are already used by IIS. The simultaneous use of these two Web servers is not possible on the same machine.
Two options are offered to you:
- Use the Web server packaged with the Network Management Proxy (Recommended option). In this case, the Microsoft Web server will be disabled.
- Use the Microsoft Web server (IIS).

For more features, it is better to use the Web server packaged with Network Management Proxy. The secured access (via SSL) of Web pages will be set automatically without configuration.

Notes:
- The IIS Web server integration is only compatible with version of IIS 5 and 6
- If you choose IIS, you have to disable the HTTP Keep-Alives Enabled option on the IIS Web Site tab to improve the capacity (in terms of connections).

II) SNMP prerequisites

The Network Management Proxy module may be compatible with the SNMP Network Management Systems of the Management-Pac 2 offer. It can manage the main EATON MIB objects and send the main alarms used for UPS supervision. The following prerequisites must then be satisfied.

Native agent prerequisites (optional):
Network Management Proxy is incorporated in the Windows native agent architecture. For this purpose, the Windows native SNMP agent must be installed on the target machine.
NOTE: you can install the native agent after having installed Network Management Proxy. However, a message will warn you if it is not installed or if it has not started during installation.

Community name prerequisites (optional):
For Network Management Proxy to be discovered by Network Management Systems, a community name with sufficient access rights (at least read only) must be configured in the native SNMP agent. This name must also appear in the SNMP hardware search parameters in the Network Management Systems.

If you use Windows XP with Service Pack 2
If you use Windows 2003 with Service Pack 1
If you use Windows Vista
Select the option Accept SNMP packets from any host in the security parameters of the SNMP service.

2.3 Management Pac 2 compatibility
For better compatibility with the Management Pac 2 offer, choose the following options proposed during installation:

<table>
<thead>
<tr>
<th>Installer text</th>
<th>Additional explanations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Internet Information Server (IIS) has been detected on your system.</td>
<td>This option is available only if IIS is installed on your system. In this case, use the Web server packaged with NMP. A direct Web link will then be proposed for the EATON UPS icon in the Network Management systems map.</td>
</tr>
<tr>
<td>For more features, it is better to use the Web server installed with Network Management Proxy. In this case, the Microsoft Web server will be disabled. Select one of the following options:</td>
<td></td>
</tr>
<tr>
<td>- Use the Web server packaged with Network Management Proxy (Recommended).</td>
<td></td>
</tr>
<tr>
<td>- Use the Microsoft Web server (IIS).</td>
<td></td>
</tr>
<tr>
<td>Do you want your system to be discovered automatically as a UPS in the Network Management Systems?</td>
<td>Your Network Management Proxy will then be recognised as an EATON UPS in the network management system map. The values of certain MIB II</td>
</tr>
</tbody>
</table>
If you choose "Yes", SNMP supervision of Windows will be replaced by UPS supervision. The objects will be overloaded by values characterising the EATON UPSs.

Now you are ready to:
install the Mgt. Proxy.
See SNMP MIB data

2.4 Standard installation

This section indicates how to install the Network Management Proxy.
If you install the Mgt. Proxy on the computer directly connected to the UPS, the computer is protected (there is no need to install Network Shutdown Module on the computer).
Follow the steps below to install the Network Management Proxy:
- Insert the “Solution Pac 2” CD-Rom and select “Network Management Proxy” or
  Connect to EATON download area. Follow the instructions to download the Mgt. Proxy.
- Make sure you have administrator rights. Double-click the downloaded file and follow the instructions.
- A screen is displayed to enter the installation directory for the Mgt. Proxy.
- If the Microsoft Web server (IIS) is installed on your system, a screen invites you to select the Web server ( Cf Installation options).

A screen invites you to choose if you want your machine to be automatically recognised as a UPS with the Network Management Systems.
If you choose “yes”, supervision of the Windows native SNMP agent will no longer be possible and will be replaced by UPS supervision.

At the end of installation, the shortcuts are created in the EATON program group.

The Mgt. Proxy has now been installed and configured with the default settings. However, it is possible to access the advanced functions: HTML configuration pages or the advanced local configuration (for shutdown management)

It is possible to test the Mgt. Proxy.

If the Mgt. Proxy has been installed and tested, the protection function is now active on the computer and will be run automatically each time the computer is started.

Install Network Shutdown Module on the other machines to be protected.

IMPORTANT
If the computer running the Mgt. Proxy is shutdown, none of the other computers are protected.

2.5 Uninstall

The Network Management Proxy may be uninstalled in two ways.

- via the Control panel and the command Add/remove programs. Select the Mgt. Proxy program.
- via the Start menu, select Programs\EATON\Network Management Proxy\Uninstall Management Proxy.
3 Use

3.1 Start and stop

- To start the protection function, select "Start Network Management Proxy" under "Programs\EATON\ Network Management Proxy" in the Start menu.

- To stop the protection function, select "Stop Network Management Proxy" in the same group of programs, i.e. under "Programs\ EATON \ Network Management Proxy" in the Start menu.

3.2 View UPS status

Use an internet browser to connect to:
https://<@IP>/nmp/
or
https://<@IP>/ if it is your web server default page.
(<@ IP> = IP address of the machine on which the Network Management Proxy is installed or the name of the machine if a DNS-name server is installed on the network).

The web pages can be accessed with secured connection via HTTPS (SSL) or with non secured connection via HTTP.
With secured connection, you must accept the security certificate before accessing to web pages.

Note :
The secured connection is not configured by default if you choose the IIS Web server integration.

Click on the Properties item of the UPS section on the left menu.
Note: This page is the default page when you connect for the first time.

Click on the **About your UPS** item on the above page to access to the UPS advanced parameters.
The **Previous** item returns to the UPS properties page.
3.3 Consult the UPS log

Click on the **Logs** item of the **UPS** section on the left menu.

Use the filter in the top right to choose the data to display:
- **Full list**: Displays all the logs.
- **Events list**: Only displays the UPS and application events.
- **Values list**: Only displays the UPS measurements.

Use the **Refresh log(s)** button to update the shown data.
Use the **Export log(s)** button to record the displayed data into a CSV file.
Use the **Clear log(s)** button to clear the displayed data.
3.4 Management Proxy test

Following installation, it is important to check that the Network Management Proxy dialogues with the UPS and responds to http requests.

3.4.1 Basic test

- You can click on the icon in EATON /Network Management Proxy program group:

  ![Icon](exploration_the_UPS)

  Or you can start the internet browser on your machine and point to the URL of the Mgt. Proxy, `http://<@IP>/nmp/` (`<@IP>` = IP address of the machine on which the Mgt. Proxy is installed or the name of the machine if a DNS-name server is installed on the network).

- Then **check that the UPS has been recognized** and that the communication status is OK.
- This test shows whether the Mgt. Proxy is operating correctly.
- If the communication status remains NOK, check **the connection with the UPS**. If the situation is still not correct, run the advanced tests.

3.4.2 Advanced tests

**Icon status**

The icon in the task bar may take on one of the four forms shown below:

| Operation on AC power | Point-to-point communication is OK. If you cannot access the UPS Properties page, check:  
|-----------------------|------------------------------------------------------------------------------------------  
|                       | • if the web server is starting in the services list (Service name: EATON Web Server Module).  
|                       | • the URL for the UPS Properties page. |

| AC input failure / operation on battery power | Point-to-point communication is OK. If you cannot access the UPS Properties page, check:  
|-----------------------------------------------|------------------------------------------------------------------------------------------  
|                                               | • if the web server is starting in the services list (Service name: EATON Web Server Module).  
|                                               | • the URL for the UPS Properties page. |
Loss of communication  | Point-to-point communication is not OK. Check:
|  | • the connection between the UPS and the Mgt. Proxy.  
|  | • If your UPS is connected via a USB cable, check that the HID Device is present in the Windows device manager. Remove the USB cable, then plug it back in to unload and reload the peripheral device.  

| Battery fault  | Point-to-point communication is OK but there is a battery fault on the UPS.  
|  | • Check the battery or change it.  
|  | If you cannot access the UPS Properties page, check:  
|  | • if the web server is starting in the services list (Service name: EATON Web Server Module).  
|  | • the URL for the UPS Properties page.  

### 3.4.3 Messages in verbose mode

**Event log:**

It is possible to consult the log files (with the .log extension) of each program. To set up the trace level for these files, use the

**Trace level parameter** that may be accessed directly via the configuration files (with the .cfg extension).

**Advanced trace:**

To validate verbose mode, run the trace program Trace.exe that is in the `<Mgt. Proxy installation directory>\bin` directory.
4  Configuration

4.1  Configuration pages

4.1.1  List of notified applications

Click on the Notified applications item of the Settings section on the left menu.

This list presents the notified applications. Two kinds of applications are in this screen:
- the SNMP network management systems
- the Network Shutdown Modules for computer protection.

SNMP Network Management Systems section:

From this page you can:
1. add a Network Management System

   For a Network Management System to be able to receive alarms from a UPS connected to a Network Management Proxy, it must be added to the list of notified applications.
Please enter the fields Application name, Host name or IP address, Community name and click on "Add a new trap receiver". You can add up to 8 Network Management Systems.

2. delete notified applications:
   To do this, select the trap receivers that you want to delete and click on “Remove selected trap receiver(s)"
   
   **Note:**
   If you remove the trap receivers, they will be definitively suppressed.

3. modify a Network Management System:
   Do modifications directly in the list, and when finish, click on the button "Save changed".

**Section Applications Network Shutdown Module:**

From this page you can:

Reset Network Shutdown Module applications:
   To do this, select the applications that you want to reset and click on “Reset selected applications”

   **Note:**
   If you have chosen the centralized configuration, the Network Shutdown Modules will automatically reconnect in the next few seconds and will update their parameters. It is used to change the parameters of several applications in only one operation.

4.1.2 Shutdown configuration

Click on the **Shutdown configuration** item of the **Settings** section on the left menu.
In standard mode, you can use this page to:
- set the name of the outlet main group.
- set the criteria triggering the shutdown procedure that are used by the Network Management Proxy depending on the type of application.
- set parameters for shutdown of the machine hosting the Mgt. Proxy.
- enable shut off the UPS if this function is enabled on your UPS.

When you enable the advanced parameters, you can use this page to:
- set the name of the controlled outlet groups.
- view the computed shutdown duration of the system which takes into account the shutdown duration of the Network Shutdown Module applications. It is the maximum of all the shutdown duration of Network Shutdown Module applications (including the proxy).
- view the criteria triggering the shutoff and restart procedure of the controlled outlet groups.
- view the computed shutdown duration of each controlled outlet group. It is the maximum of the Network Shutdown Module shutdown duration which are powered by the corresponding controlled outlet group.

Note: The parameters of the controlled outlet groups are only visible if your UPS has some controlled outlets.

The shutdown configuration can also be carried out locally by the settings utility on the machine hosting Network Management Proxy.
4.1.3  Central parameters of Network Shutdown Module

Click on the Central parameters item of the Settings section on the left menu.

On this page, you define either the shutdown or the notification settings for the Network Shutdown Modules that connect to Network Management Proxy. These settings are used by the Network Shutdown Modules if they are in centralized-configuration mode or if their configuration is not valid.

If you wish to set up a new configuration for the Network Shutdown Modules already set to centralized-configuration mode, proceed as indicated below:

- Change the Network Shutdown Module parameters (in the page above).
  - Shutdown after (time before shutdown)
  - Shutdown duration
  - Broadcast message to the administrator.
  - Broadcast message to the users.
- Click the Save button.
- Open the List of notified applications.

Select the Network Shutdown Modules to receive the new configuration.

Press the button to reset the selected applications. They reconnect and use the new configuration.
4.1.4 Users accounts configuration

Click on the Users accounts item of the Settings section on the left menu.

You can configure several user accounts.

To add a user accounts:
- enter the User Login and the User password:
- select the User’s Rights level. The following levels are available:
  - Visualization – Management (the user will be able to access all the sections)
  - Visualization (the user will only access UPS (*) and About sections)
- click on Create new user button

(*) Remove logs function in UPS logs panel is only functional with Visualization – Management user's right.
4.1.5 Configure system parameters

Click on the **System settings** item of the **Settings** section on the left menu.

This page lets you enter the system parameters for the application.

It contains:
- The UPS administrator name.
- The UPS localisation.

These data correspond to `sysContact` and `sysLocation`, respectively, of the MIB II. They are accessible via a MIB SNMP browser.

**Note:**
UPS localisation is visible in the UPS properties page in the UPS definition section.
4.2 Advanced local configuration

A configuration tool (specific to the Mgt. Proxy and not available with the Network Management Card) can be used to modify the advanced parameters for installation protection. The tool can be accessed via the Advanced settings button in the window displaying UPS status or via the Start menu Program\ EATON \ Network Management Proxy\Advanced settings:

The main parameters that can be modified include:
- local shutdown management
- events / action
- UPS parameters.

4.2.1 Local shutdown management

The screen below can be used to define locally the same settings as those on the Shutdown settings web page.

The screen is used to:
- set the criteria tripping the shutdown procedure and used by the Mgt. Proxy depending on the type of application;
- enable and set parameters for shutdown of the machine hosting the Mgt. Proxy;
- enable shutdown of the UPS.

4.2.2 Events / action

The general idea is that the Network Management Proxy control module receives information on events (e.g. loss of AC power) from the UPS and reacts to the events by initiating action (e.g. data logging or notification, etc.).
Secondly, the "event/action" sequences are presented as a tree structure and users are provided with a tool to set up the sequences run by the control module and thus customize their protection function.

This very powerful tool may be used intuitively to completely modify the operation of the control module. To modify the event/action tree, use the context-sensitive menu accessed with the right mouse button and the help supplied in each screen.

However, it is not necessary to modify events and action unless the protection module must carry out a very specific function. The default configuration already ensures optimum protection of your installation. Caution is advised when making modifications in the parameters because they may disrupt the protection functions for your installation.

The root of the tree structure offers access to the button used to reinitialize the default parameters and to information on the main icons used in the tree structure.

![Event/Action Tree Structure](image)

4.2.3 UPS parameters

The presence of this screen depends on the type of UPS connected to the Network Management Proxy. For the type of UPS below, it is possible to set up the programmable outlets.
4.3 Shutdown parameters

4.3.1 Shutdown criteria

These three criteria determine when the shutdown procedure starts. If more than one criterion is selected, the first to occur trips the start of the shutdown procedure.

**Shutdown when timer reaches (Shutdown after)**

After AC power failure before initiating the system shutdown procedure, this is the time in seconds that the system waits. This value must be selected to provide users with enough time to close their applications and disconnect, but within the battery backup time provided by the UPS. See the UPS manual for information on the backup time. If another criterion occurs before the end of the shutdown timer, the shutdown procedure is immediately run. The role of this parameter is illustrated by the example of shutdown sequence.

Remark

If the shutdown timer on a client is the criterion that trips the shutdown procedure, automatic restart of the client is not guaranteed (the case where AC power returns and only the client station is shut down).

Possible values: 0 to 999999
Default value: this criterion for system shutdown is not enabled
Unit: second

**Shutdown when battery charge level below**

Network Management Proxy monitors the UPS data and when it detects that the battery level has dropped below the set threshold, it starts the shutdown procedure for Network Shutdown Module and for itself.
The role of this parameter is illustrated by the example of shutdown sequence.
Possible values    : 0 to 100
Default value      : 20 (may depend on the UPS)
Unit                : Percentage

**Shutdown when remaining backup time below**

Following loss of AC power, The Network Management Proxy monitors the UPS data and when it detects that the remaining backup time has dropped below the set threshold, it starts the shutdown procedure for Network Shutdown Module and for itself.

The role of this parameter is illustrated by the example of shutdown sequence.
Possible values    : 0 to 999999
Default value      : This system-shutdown criteria is not enabled
Unit                : Second

### 4.3.2 Shutdown parameter

**Shutdown duration**

This is the time in seconds required by the system to go through its shutdown procedure. The Network Shutdown Modules transmit their own shutdown duration to the proxy. It is on the basis of these values (shutdown duration of all the client systems and shutdown duration of the machine hosting the Network Management Proxy) that the proxy sends the delayed shutdown order to the UPS.

The role of this parameter is illustrated by the example of shutdown sequence.
Possible values    : 0 to 9999
Default value      : 120
Unit                : Second
5 Appendix

5.1 SNMP MIB data of Network Management Proxy

The Network Management Proxy module proposes a simple MIB for compatibility with the Management-Pac 2 offer. This offer contains the EATON kits integrating the UPSs with the main SNMP network management systems (NMS).

The main EATON NMS integration functions are as follows:
- autodiscovery is the recognition of EATON UPSs in the network management system map
- the Web link proposed between the EATON UPS icon in the network management system map and the UPS Properties Web page
- reception of alarms (popup, log) and classification per level of criticality
- menu management in the Unix NMS (IBM Tivoli Netview * and HP-OV HP-UX)

(*) on IBM Tivoli Netview, to benefit from EATON UPS menu management with the Network Management Proxy module, you must force the variable isSNMPSupported to TRUE.

Procedure:
- Go to the menu: “Edit -> Modify/Describe-> Object”.
- Select “General Attributes”.
- Click “View/Modify Object Attributes … “.
- Click the radio button “True” for “isSNMPSupported”

Objects supported for the MIB II:
MIB II defines the standard SNMP objects.
The following OID describes the entry point of the MIB II database “system” group in the Internet tree: 
{iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1).system(1)}

The Network Management Proxy module implements a simplified SNMP data structure, only the following objects are implemented if the first option has been ticked on installation.

System group:

<table>
<thead>
<tr>
<th>Object identifier (OID)</th>
<th>Object name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3.6.1.2.1.1.1</td>
<td>sysDescr</td>
<td>System identification</td>
</tr>
<tr>
<td>1.3.6.1.2.1.1.2</td>
<td>sysObjectID</td>
<td>The autodiscovery mechanism is based on comparison of this object with the value 1.3.6.1.4.1.705.1.2</td>
</tr>
<tr>
<td>1.3.6.1.2.1.1.4</td>
<td>sysContact</td>
<td>Details of the person to contact for the system</td>
</tr>
<tr>
<td>1.3.6.1.2.1.1.5</td>
<td>sysName</td>
<td>System name</td>
</tr>
<tr>
<td>1.3.6.1.2.1.1.6</td>
<td>sysLocation</td>
<td>System localisation</td>
</tr>
</tbody>
</table>

Objects supported for the EATON MIB:

The EATON MIB defines all objects for managing UPSs on a Network.
The following OID refers to the entry point of the MG UPS MIB in the Internet tree:
The Network Management Proxy module implements a simplified SNMP data structure: only the following objects are implemented.

Group 1: upsmgIdent: "UPS Identification Group"

<table>
<thead>
<tr>
<th>Object ID</th>
<th>Object Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3.6.1.4.1.705.1.1.1.0</td>
<td>UpsmgIdentFamilyName</td>
<td>UPS Family name. i.e.</td>
</tr>
<tr>
<td>Objet ID</td>
<td>Object Name</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.1.2.0</td>
<td>UpsmgIdentModelName</td>
<td>&quot;PULSAR&quot;, &quot;GALAXY&quot;, etc.</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.1.7.0</td>
<td>UpsmgIdentSerialNumber</td>
<td>UPS serial number.</td>
</tr>
</tbody>
</table>

**Group 4: upsmgConfig: "UPS Configuration Group"**

<table>
<thead>
<tr>
<th>Objet ID</th>
<th>Object Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3.6.1.4.1.705.1.4.8.0</td>
<td>UpsmgConfigLowBatteryLevel</td>
<td>Integer Minimum battery charge level, at which UPS shutdown is initiated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( % )</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.4.9.0</td>
<td>UpsmgConfigAutoRestart</td>
<td>Integer &quot;Automatic restart&quot; status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>always(1) never(2) onmain(3)</td>
</tr>
</tbody>
</table>

**Group 5: upsmgBattery: "UPS battery backup time group"**

<table>
<thead>
<tr>
<th>Objet ID</th>
<th>Object Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3.6.1.4.1.705.1.5.1.0</td>
<td>UpsmgBatteryRemainingTime</td>
<td>Integer Remaining battery backup time. ( seconds )</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.5.2.0</td>
<td>UpsmgBatteryLevel</td>
<td>Integer Battery charge level. ( % )</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.5.9.0</td>
<td>UpsmgBatteryFaultBattery</td>
<td>Battery fault indicator: yes(1), no(2).</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.5.11.0</td>
<td>UpsmgBatteryReplacement</td>
<td>Battery replacement indicator: yes(1), no(2).</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.5.14.0</td>
<td>UpsmgBatteryLowBattery</td>
<td>Low battery indicator: yes(1), no(2).</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.5.15.0</td>
<td>UpsmgBatteryChargerFault</td>
<td>UPS Internal failure: yes(1), no(2).</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.5.16.0</td>
<td>UpsmgBatteryLowCondition</td>
<td>State indicating that battery has entered low condition: yes(1), no(2).</td>
</tr>
</tbody>
</table>

**Groupe 6: upsmgInput: " UPS input group "**

<table>
<thead>
<tr>
<th>Objet ID</th>
<th>Object Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3.6.1.4.1.705.1.6.2.1.1.1</td>
<td>UpsmgInputPhaseTable.upsmgInputPhaseEntry.mginputIndex.1</td>
<td>Integer Index number 1 in the table</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.6.2.1.1.2</td>
<td>UpsmgInputPhaseTable.upsmgInputPhaseEntry.mginputIndex.2</td>
<td>Integer Index number 2 in the table</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.6.2.1.1.3</td>
<td>UpsmgInputPhaseTable.upsmgInputPhaseEntry.mginputIndex.3</td>
<td>Integer Index number 3 in the table</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.6.2.1.2.1</td>
<td>UpsmgInputPhaseTable.upsmgInputPhaseEntry.mginputVoltage.1</td>
<td>Integer Input voltage for phase 1</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.6.2.1.2.2</td>
<td>UpsmgInputPhaseTable.upsmgInputPhaseEntry.mginputVoltage.2</td>
<td>Integer static value &quot;0&quot;</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.6.2.1.2.3</td>
<td>UpsmgInputPhaseTable.upsmgInputPhaseEntry.mginputVoltage.3</td>
<td>Integer static value</td>
</tr>
</tbody>
</table>
### Group 7: upsmgOutput: "UPS output group"

<table>
<thead>
<tr>
<th>Objet ID</th>
<th>Object Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.1.1</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputPhaseIndex.1</td>
<td>Integer Index number 1 in the table</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.1.2</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputPhaseIndex.2</td>
<td>Integer Index number 2 in the table</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.1.3</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputPhaseIndex.3</td>
<td>Integer Index number 3 in the table</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.2.1</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputVoltage.1</td>
<td>Integer Output voltage phase 1 dV</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.2.2</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputVoltage.2</td>
<td>Integer static value &quot;0&quot;</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.2.3</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputVoltage.3</td>
<td>Integer static value &quot;0&quot;</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.3.1</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputFrequency.1</td>
<td>Integer Output frequency phase 1 dHz</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.3.2</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputFrequency.2</td>
<td>Integer static value &quot;0&quot;</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.3.3</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputFrequency.3</td>
<td>Integer static value &quot;0&quot;</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.4.1</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputLoadPerPhase.1</td>
<td>Load per phase for phase 1</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.4.2</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputLoadPerPhase.2</td>
<td>Integer static value &quot;0&quot;</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.4.3</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputLoadPerPhase.3</td>
<td>Integer static value &quot;0&quot;</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.5.1</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputCurrent.1</td>
<td>Output current for Phase 1</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.5.2</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputCurrent.2</td>
<td>Integer static value &quot;0&quot;</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.2.1.5.3</td>
<td>upsmgOutputPhaseTable.upsmgOutputPhaseEntry.mgoutputCurrent.3</td>
<td>Integer static value &quot;0&quot;</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.3.0</td>
<td>upsmgOutputOnBattery</td>
<td>UPS is on battery: yes(1), no(2)</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.4.0</td>
<td>upsmgOutputOnByPass</td>
<td>Bypass state: yes(1), no(2)</td>
</tr>
<tr>
<td>1.3.6.1.4.1.705.1.7.7.0</td>
<td>upsmgOutputUtilityOff</td>
<td>UPS in battery backup time: yes(1), no(2)</td>
</tr>
</tbody>
</table>
Group 12: upsmsgAgent: "UPS agent group"

<table>
<thead>
<tr>
<th>Objet ID</th>
<th>Object Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3.6.1.4.1.705.1.12.13.0</td>
<td>upsmsgAgentCommUPS</td>
<td>State of communication with UPS. Communication OK (1) No communication (2).</td>
</tr>
</tbody>
</table>

Traps supported for the Network Management Proxy module:

Group 11: upsmsgTraps: "UPS trap group"

<table>
<thead>
<tr>
<th>Trap number</th>
<th>Trap name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>upsBatteryFault</td>
<td>UPS battery fault status</td>
</tr>
<tr>
<td>2</td>
<td>upsBatteryOK</td>
<td>Previous trap reverse status</td>
</tr>
<tr>
<td>7</td>
<td>upsChargerFault</td>
<td>UPS battery charger fault status</td>
</tr>
<tr>
<td>8</td>
<td>upsChargerOK</td>
<td>Previous trap reverse status</td>
</tr>
<tr>
<td>9</td>
<td>upsAtLowCondition</td>
<td>UPS battery minimum condition status</td>
</tr>
<tr>
<td>10</td>
<td>upsFromLowCondition</td>
<td>Previous trap reverse status</td>
</tr>
<tr>
<td>13</td>
<td>upsOnByPass</td>
<td>UPS on bypass status</td>
</tr>
<tr>
<td>14</td>
<td>upsOnByPass</td>
<td>Previous trap reverse status</td>
</tr>
<tr>
<td>17</td>
<td>upsUtilityFailure</td>
<td>UPS mains input failure indicator</td>
</tr>
<tr>
<td>18</td>
<td>upsUtilityRestored</td>
<td>Previous trap reverse status</td>
</tr>
<tr>
<td>21</td>
<td>upsOverLoad</td>
<td>UPS load in excess of rated value</td>
</tr>
<tr>
<td>22</td>
<td>upsLoadOK</td>
<td>Previous trap reverse status</td>
</tr>
<tr>
<td>37</td>
<td>upsCommunicationFailure</td>
<td>State of serial communication with UPS</td>
</tr>
<tr>
<td>38</td>
<td>upsCommunicationRestored</td>
<td>Previous trap reverse status</td>
</tr>
<tr>
<td>47</td>
<td>upsBatteryTestOK</td>
<td>UPS battery test status</td>
</tr>
<tr>
<td>48</td>
<td>upsBatteryTestFail</td>
<td>Previous trap reverse status</td>
</tr>
</tbody>
</table>
5.2 Shutdown sequence

Typical example of the backup time provided by a UPS connected to Network Management Proxy:

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>As soon as it detects the loss of AC power, the Mgt. Proxy notifies the Network Shutdown Modules that the system is running on battery power.</td>
</tr>
<tr>
<td>2</td>
<td>The Mgt. Proxy then continuously monitors the criteria set to trip the shutdown procedure. The procedure is launched if:</td>
</tr>
<tr>
<td></td>
<td>1. the shutdown time delay (*) (in seconds), started when the loss of AC power occurred, expires.</td>
</tr>
<tr>
<td></td>
<td>2. the UPS battery level drops below (*) a threshold expressed in %.</td>
</tr>
<tr>
<td></td>
<td>3. the UPS backup time drops below (*) a threshold expressed in seconds.</td>
</tr>
<tr>
<td></td>
<td>4. the UPS backup time reaches the maximum value of the &quot;shutdown duration&quot; parameters</td>
</tr>
<tr>
<td></td>
<td>The Mgt. Proxy centralises the &quot;shutdown duration&quot; parameters for all the protected computers (machines hosting Network Shutdown Module or the Mgt. Proxy). This fourth tripping criterion is implicit.</td>
</tr>
<tr>
<td>3</td>
<td>The Mgt. Proxy launches the shutdown procedure:</td>
</tr>
<tr>
<td></td>
<td>• The Mgt. Proxy sends to all the Network Shutdown Modules the system-shutdown order. As a result, each Network Shutdown Module proceeds with shutdown of its system.</td>
</tr>
<tr>
<td></td>
<td>• The Mgt. Proxy also launches the shutdown of the server on which it is installed (*).</td>
</tr>
<tr>
<td>4</td>
<td>Once all the computers have been shut down, the UPS shuts off (interrupts the supply of power to the loads) to protect the battery (*). Note. This function is not authorised on some UPSs.</td>
</tr>
<tr>
<td>5</td>
<td>Once the utility is restored, the UPS restarts all computers (if shut off the UPS output is a function available).</td>
</tr>
</tbody>
</table>

(*) These options or parameters are set on the Shutdown-sequence configuration page.
The diagrams below present the sequence.

Example

A UPS protects four machines: 1 Mgt. Proxy and 3 Network Shutdown Modules. Client 3 is programmed to shut down before the others to take some of the load off the UPS.

<table>
<thead>
<tr>
<th>Network Management Proxy</th>
<th>Client 1</th>
<th>Client 2</th>
<th>Client 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shutdown when battery level drops to</td>
<td>30 %</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Shutdown time delay</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Shutdown duration</td>
<td>120 sec</td>
<td>120 sec</td>
<td><strong>180 sec</strong></td>
</tr>
</tbody>
</table>

The main output shutdown duration is equal to 180 sec. It is the shutdown duration of the client 2 (maximum of all the clients shutdown duration including the proxy).
5.3 Error messages

During installation

1. The installation program detected UM-Agent in your system. It must be uninstalled before installing the Network Management Proxy.

**Result.** Installation is interrupted.

**Solution.** Uninstall UM-Agent via the control panel and the Add/remove programs command, then try again.

2. The installation program detected Personal Solution Pac in your system. It must be uninstalled before reinstalling the Network Management Proxy.

**Result.** Installation is interrupted.

**Solution.** Uninstall Personal Solution Pac via the control panel and the Add/remove programs command, then try again.

3. The previous version of the Network Management Proxy must first be uninstalled.

**Result.** Installation is interrupted.

**Solution.** Via the control panel and the Add/remove programs command, uninstall the former version of the Mgt. Proxy that was detected in your system, then try again.

During use

*Error messages in the xmlagent_d.log file.*

4. Fatal error. Failure to open [XML_Agent.cfg] configuration file or access LOG_MESSAGE_LEVEL parameter.

**Solution.** Check that the XML_Agent.cfg file is present and that the LOG_MESSAGE_LEVEL parameter has been set up (by default, LOG_MESSAGE_LEVEL="2").

5. Failure to initialize communication...

**Solution.** Check that PCTL.exe has been run.


**Solution.** Memory problem. Increase your RAM or shutdown other applications.
<table>
<thead>
<tr>
<th>Error. Failure to generate XML properties file [upsprop.xml].</th>
<th>Solution. Check that no the Mgt. Proxy directories have been deleted.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8.</strong> Thread WaitClient WSAStartup failed or Thread WaitClient socket creation failed or Thread WaitClient bind or Thread WaitClient listen failed.</td>
<td>Solution. Problem initializing the communication layers via &quot;socket&quot;. Restart the Mgt. Proxy.</td>
</tr>
<tr>
<td><strong>9.</strong> Thread WaitClient. Invalid socket for new client.</td>
<td>Solution. Problem initializing the communication layers via &quot;socket&quot;. Restart the Mgt. Proxy.</td>
</tr>
<tr>
<td><em>In the HTML pages.</em></td>
<td></td>
</tr>
<tr>
<td><strong>10.</strong> Cannot display the UPS properties page. HTTP 404 error with IE.</td>
<td>Solution. Check the URL entered. It should be https://&lt;IP address of the Mgt. Proxy server&gt;/nmp/</td>
</tr>
<tr>
<td><strong>11.</strong> When you attempt to view the properties or configuration pages, the browser requests a user name and password.</td>
<td>Solution. The system administrator has protected access to the pages. You must request a user name and password from your administrator.</td>
</tr>
<tr>
<td><strong>12.</strong> No UPS information is available.</td>
<td>Solution. Check that communication between the UPS and the computer is OK.</td>
</tr>
<tr>
<td><strong>13.</strong> The data acquisition date (in the right-hand corner of the UPS properties page) is not refreshed.</td>
<td>Solution. Check that xmlagent_d.exe has been run on the Mgt. Proxy server.</td>
</tr>
<tr>
<td><em>Alarm notification.</em></td>
<td></td>
</tr>
<tr>
<td><strong>15.</strong> No alarm messages are received from clients NSM clients.</td>
<td>Solution. Check that the notify_d.exe process has been run on the Mgt. Proxy server. Ask your system administrator if there is a firewall between the Mgt. Proxy server and your computer. In this case, the firewall must be set up using the port number in the notify_d.cfg file.</td>
</tr>
</tbody>
</table>
6 Glossary

**IP address**
When TCP/IP is installed on a computer, an address is assigned to the system. Each address is unique and is made up of four numbers, each between 0 and 256 (e.g. 168.8.156.210).

**Network Management Proxy**
Network Management Proxy is used to control a UPS and connect it to the TCP/IP network.

**NMS (Network Management System):**
The NMS supervises SNMP devices connected to the TCP-IP Network.

**Network Shutdown Module**
Network Shutdown Module is a software module that uses the information transmitted by the Network Management Proxy to inform computer users on the current status of the electrical power supplied to the computer. If the supply of electrical power from the EATON UPS is at risk, Network Shutdown Module initiates orderly shutdown of the computer under the most secure conditions possible.

**Shutdown Duration**

**Shutdown Timer**

**SNMP (Simple Network Management Protocol):**
Application level protocol providing TCP/IP-based network management services. SNMP provides communication services between managers and agent and defines three actions:
- reading the content of MIB objects (GET and GETNEXT requests are sent from managers to agent),
- setting the content of MIB objects (SET requests are sent from managers to agent),
- asynchronous notification of events (TRAP requests are sent from agent to managers).
SNMP V1 is defined by RFC 1157. To secure communication, EATON has developed a trap acknowledgment mechanism.

**SSL (Secure Socket Layer, created by Netscape)**
A solution for securing transactions over the internet. SSL is a communication protocol that authenticates the data exchanged, as well as ensuring its confidentiality and integrity. The protocol uses a recognized encryption method, the **RSA algorithm with a public key** (where RSA means Rivest, Shamir and Adleman, the inventors). An RSA key is the result of operations involving prime numbers. SSL is built into the internet browsers on the market. The padlock in the bottom of your browser screen is automatically displayed if the server sending information uses SSL.

**TCP/IP (Transmission Control Protocol / Internet Protocol)**
Family of protocols for the transport and network layers.

** Trap:**
Asynchronous notification of an event sent spontaneously by the agent to a manager when an event needs to be reported to the manager.
An information set may be extracted from the agent's MIB and associated with the trap sent to the manager.

**XML (Extensible Markup Language)**
This language, a sub-set of the SGML language, is fully presented in this document. The goal is to enable generic SGML to be transmitted, received and processed over the web just as HTML is today. XML was designed to be easy to use and interoperable with SGML and HTML.