

# APC Managed Services Integration Kit

## APC Smart-UPS® and SolarWinds Network Performance Monitor (NPM) RMM Integration

### Installation and Configuration Guide

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# Table of Contents

Preliminary Information .....	1
Introduction .....	1
System Requirements .....	1
Supported Devices .....	1
Related Documents .....	1
Terminology .....	1
Prerequisites and Discovery .....	2
Configure the Network Management Card SNMP Settings .....	2
NPM Network Sonar Discovery .....	3
SNMP Universal Device Pollers, Trap Rules and Alert Actions .....	4
Overview .....	4
Inventory .....	4
Object Identifiers (OIDs) .....	5
Installation .....	6
Prerequisites .....	6
Import the Universal Device Pollers .....	6
Assign the Universal Device Pollers to Network Devices .....	7
View SNMP Polling Data .....	7
Assign Alert Actions .....	7
Edit Trigger Conditions .....	8
Import SNMP Trap Rules .....	8

# Preliminary Information

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## Introduction

APC Managed Services Integration Kits provide advanced SNMP monitoring of APC Smart-UPS® with Remote Monitoring and Management (RMM) solutions, using integrated SNMP Universal Device Pollers. This document details the process to configure SNMP polling and traps for APC Smart-UPS, using the SolarWinds Network Performance Monitor RMM solution. The SNMP Object Identifiers (OIDs) and traps detailed allow Managed Service Providers to monitor APC Smart-UPS with a Network Management Card (NMC) AP9630, AP9631 or AP9635 installed.

## System Requirements

To configure NPM for SNMP Monitoring of APC Smart-UPS, the following configuration is required:

- SolarWinds Network Performance Monitor (NPM) version 11.5 or higher.
  - To download SolarWinds NPM, visit the **NPM website** for download information, and terms and conditions.
  - See the **SolarWinds NPM support website** for specific operating system requirements and technical support.
- APC Smart-UPS devices with an NMC 2 installed. See “Supported Devices”.
  - SNMPv1 and SNMPv3 are supported.

## Supported Devices

Advanced SNMP monitoring of APC Smart-UPS with SolarWinds NPM is available for APC Smart-UPS devices with a Network Management Card 2 installed (AP9630, AP9631 and AP9635).

## Related Documents

The APC by Schneider Electric website, **www.apc.com**, includes the following UPS Network Management Card documentation:

- **Network Management Card 2 Installation Guide**, for AP9630, AP9631, and AP9635. See the NMC 2 Installation Guide for detailed instructions on the installation and configuration of the Network Management card for APC Smart-UPS.
- **Network Management Card 2 User Guide**, for AP9630, AP9631, and AP9635. See the NMC 2 User Guide for detailed network and SNMP configuration of the Network Management Card 2.

## Terminology

### Universal Device Poller (UnDP)

A collection of OID queries and descriptions that can be used in NPM to monitor statistics on data made available by devices on the network. The UnDP pollers provided by APC collect real-time and historic UPS data associated with object IDs defined in the APC PowerNet MIB.

### Trap Rules

A set of rules to define the UPS events upon which SolarWinds NPM will receive SNMP Traps. Traps can be viewed in the Trap Viewer application.

# Prerequisites and Discovery

## Configure the Network Management Card SNMP Settings

For most network monitoring and management tasks, NPM uses Simple Network Management Protocol (SNMP). NPM can communicate via SNMPv1 and SNMPv3. All Network Management Cards installed in APC Smart-UPS present on the network must be configured to communicate via SNMP in order to be discovered by NPM, and to send SNMP Traps to NPM.

For each Network Management Card on the network, open the **NMC Web interface** in a web browser.

### SNMPv1 Configuration

To confirm that SNMPv1 is enabled, go to **Configuration > Network > SNMPv1 > Access** and check that the **Enable** checkbox is selected. SNMPv1 is enabled by default.

1. Go to **Configuration > Notification > SNMP Traps > Trap Receivers** and click **Add Trap Receiver**.
2. Enter the Trap Receiver details of the NPM Orion Server. See the **SolarWinds NPM Administrator Guide** for more information on the NPM Orion Server. Enter:
  - **Trap Generation:** Enable
  - **NMS IP / Host Name:** Enter the IP Address of the NPM Orion server.
  - **Language:** Select desired language of SNMP Traps. English is the default.
  - **SNMPv1 Community Name:** Enter the Community String to be used in the Network Discovery Process. The default string is `public`.
  - **Authenticate traps:** Enable.
3. Click **Apply** to save the Trap Receiver settings.

### SNMPv3 Configuration

1. Go to **Configuration > Network > SNMPv3 > Access** and select the **Enable** checkbox, and click **Apply**. To reboot the management interface for the change to take effect, go to **Control > Network > Reset/Reboot** and **Reboot the Management Interface**.
2. To set up an SNMPv3 User Profile that the NMC uses to communicate with NPM, go to **Configuration > Network > SNMPv3 > User Profiles**. Click on the name of a default user profile (e.g. `apc snmp profile1`). Enter:
  - a. **User Name:** The User Name of the SNMP profile, which is used in the SNMP settings of the NPM Network Sonar Discovery process. See “NPM Network Sonar Discovery” on page 3.
  - b. **Authentication Passphrase:** A phrase of 15 to 32 ASCII characters (`apc auth passphrase` by default) used to verify the Authentication protocol.
  - c. **Authentication Protocol:** Select either SHA or MD5 as the method of authentication.
  - d. **Privacy Passphrase:** A phrase of 15-32 ASCII characters (`apc crypt passphrase` by default) used to verify the privacy protocol.
  - e. **Privacy Protocol:** Select either AES or DES as the method of encryption.

Be sure to enter all of the Authentication and Privacy details, as they are required for SNMPv3 communication with NPM. Click **Apply** to save the configuration.

3. To specify that NPM has access via SNMPv3 to the NMC, go to **Configuration > Network > SNMPv3 > Access Control**
  - a. Click on the User Profile **User Name** to edit the Access Control.
  - b. Select the **Enable** checkbox.
  - c. Select the **User Name** created in step 2 from the drop-down list.
  - d. For **NMS IP/Host Name**, enter the IP address of the NPM Orion server. See the **SolarWinds NPM Administrator Guide** for more information.
  - e. Click **Apply** to save the configuration.
4. Go to **Configuration > Notification > SNMP Traps > Trap Receivers** and click **Add Trap Receiver**.
5. Enter the Trap Receiver details of the **NPM Orion server**. Enter:
  - **Trap Generation**: Enable
  - **NMS IP / Host Name**: Enter the IP Address of the NPM Orion server.
  - **Language**: Select desired language of SNMP Traps. English is the default.
  - **SNMPv3 User Name**: Select the user name of the User Profile configured in step 2.
6. Click **Apply** to save the Trap Receiver settings.

## NPM Network Sonar Discovery

Once each NMC on the network has been configured for SNMP communication, a discovery process can be initiated in NPM to discover all of the SNMP-enabled devices on the network. Enter the NPM web user interface and click **Settings > Network Sonar Discovery** to initiate the process.



For detailed instructions on how to use the Network Sonar Wizard, see the *SolarWinds NPM Administrator Guide* on the **SolarWinds NPM support website**.

Upon successful completion of the Network Sonar Discovery:

1. Visit **Home > Summary > All Nodes** to see a listing of Network Devices grouped by vendor.
2. Click on **American Power Conversion Corp.** to view all SNMP-enabled APC devices on the network.

# SNMP Universal Device Pollers, Trap Rules and Alert Actions

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## Overview

The *Managed Services Integration Kit for SolarWinds NPM* includes SNMP Universal Device Pollers, Trap Rules and Alert Actions for APC Smart-UPS and NPM, and is available for download from the **APC by Schneider Electric** website, [www.apc.com](http://www.apc.com).

## Inventory

The self-extracting executable contains 9 files:

- **APC Smart UPS – About**  
The About Universal Device Poller (UnDP) provides information about the UPS such as Model Name, Manufacture Date and Serial Number. See “SNMP About Information” on page 5.
- **APC Smart UPS – Config**  
The Config UnDP provides information about the configuration of the UPS, such as Battery Runtime and Battery Test Schedule. See “SNMP Configuration Information” on page 5.
- **APC Smart UPS – Status**  
The Status UnDP provides information about the status of the UPS, such as Battery Status, Runtime Remaining, and time on battery. See “SNMP Status Information” on page 5.
- **APC Smart UPS – Trap Rules:**
  - a. APC Smart UPS Traps - Informational.TrapRule
  - b. APC Smart UPS Traps - Warning.TrapRule
  - c. APC Smart UPS Traps - Severe.TrapRule

The Trap Rule files define a set of UPS events upon which SNMP Traps can be raised. The events are divided into three files: Informational events, Warning events and Severe events. This allows for the configuration of appropriate notifications, based upon severity. See “SNMP Trap Rules” on page 5.

- **APC Alert Actions**

Three XML files:

- a. **APC Smart-UPS Battery Runtime 10 Minutes:** Configure an alert when Battery Runtime Remaining is below 10 minutes.
- b. **APC Smart-UPS On Battery 5 Minutes:** Configure an alert when the UPS has been on battery power for 5 minutes or more.
- c. **APC Smart-UPS Output Overload:** Configure an alert when the load connected to the UPS exceeds 90% of the load capacity of the UPS.

See “Assign Alert Actions” on page 7.

## Object Identifiers (OIDs)

The table below lists the OID names made available in each UnDP file. They provide APC Smart-UPS status and configuration information for SNMP polling, and SNMP trap alerts for key events. Descriptions of the OIDs can be viewed in the UnDP application, see the **SolarWinds NPM Administrator Guide** for more information on this application.

### SNMP About Information

- upsAdvBatteryExternalSKU
- upsAdvBatteryInternalSKU
- upsAdvIdentDateOfManufacture
- upsAdvIdentSerialNumber
- upsAdvIdentSkuNumber
- upsBasicBatteryLastReplaceDate
- upsBasicIdentModel

### SNMP Configuration Information

- upsAdvConfigLowBatteryRunTime
- upsAdvTestDiagnosticSchedule

### SNMP Status Information

- iemStatusProbeCurrentHumid
- iemStatusProbeCurrentTemp
- upsAdvBatteryRunTimeRemaining
- upsAdvInputLineFailCause
- upsAdvStateAbnormalConditions
- upsAdvTestDiagnosticsResults
- upsBasicOutputStatus
- upsEstimatedMinutesRemaining
- upsHighPrecBatteryCapacity
- upsHighPrecBatteryTemperature
- upsHighPrecOutputLoad
- upsOutputSource
- upsSecondsOnBattery
- upsBatteryStatus

### SNMP Trap Rules

#### Informational

- batteryOverTemperatureCleared
- powerRestored
- returnFromBypass
- upsCriticalConditionCleared
- upsDiagnosticsPassed
- upsInformationalCondition
- upsInformationalConditionCleared
- upsOverloadCleared

#### Warning

- batteryOverTemperature
- upsSleeping
- upsOutletGroupTurnedOff
- upsWarningCondition
- upsWarningConditionCleared

#### Severe

- communicationLost
- hardwareFailureBypass
- lowBattery
- upsBatteryNeedsReplacement
- upsCriticalCondition
- upsDiagnosticsFailed
- upsOnBattery
- upsOverload

### Additional OIDs

By default, SolarWinds NPM also includes some additional OIDs for monitoring APC devices. The OIDs are provided in the Orion Universal Device Poller interface in the directory **All Defined Pollers > Example**. The OIDs available are:

- upsAdvBatteryCapacity
- upsInputLineVoltage
- upsAdvOutputLoad
- upsBasicBatteryStatus

The OIDs can be assigned to APC devices; see **Assign the Universal Device Pollers to Network Devices**.

To more easily identify a UPS in the NPM web interface, you can also specify the **Location** and **Contact** details of the UPS. To do this:

1. In the Network Management Card web interface, you can set the UPS Identification fields, under **Configuration > General > Identification**.
2. To view the UPS **Location** and **Contact** in the SolarWinds NPM web interface, go to **Home > All Nodes > American Power Conversion Corp.** and select the APC device.



# Installation

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## Prerequisites

In advance of installing Universal Device Pollers, Trap Rules and Alert Actions to NPM, make sure that the following steps are complete:

1. Each Network Management Card on the network has been configured for SNMP. See “Configure the Network Management Card SNMP Settings” on page 2.
2. The NPM Network Sonar Discovery process is complete, and SNMP-enabled devices have been found on the network and are displayed under All Nodes on the NPM web user interface summary page. See “NPM Network Sonar Discovery” on page 3.
3. The SNMP UnDPs, Trap Rules and Alert Action files have been downloaded from the APC website. See “SNMP Universal Device Pollers, Trap Rules and Alert Actions” on page 4.

There are three steps in the process to add SNMP monitoring for APC Smart-UPS to NPM:

1. Import the Universal Device Pollers to NPM and assign them to APC Smart-UPS devices on the network. See “Import the Universal Device Pollers” on page 6.
2. Import the Alert Actions for UnDP data, and configure the trigger conditions for APC Devices. See “Assign Alert Actions” on page 7.
3. Import SNMP Trap Rules and configure the Trap Viewer to display the Trap severity. See “Import SNMP Trap Rules” on page 8.

## Import the Universal Device Pollers

1. Download the *Managed Services Integration Kit for SolarWinds NPM* and APC Smart-UPS from [www.apc.com](http://www.apc.com). Save the files to your computer.
2. Open the Orion Universal Device Poller application, which is installed as part of NPM. See the **SolarWinds NPM Administrator Guide** for more information on this application.
3. Select **File > Import Universal Device Pollers**:
  - a. Navigate to the directory where the three *.UnDP* files were saved in step 1. Select a *.UnDP* file and click **Open**. Repeat for all three *.UnDP* files.
  - b. Select each of the *.UnDP* files in the *Pollers* pane and click **Import >>** to move them to the *Selected Pollers* pane.
  - c. Click **OK** to import the UnDP files.
4. You can configure how frequently the polling engine requests information from devices. To edit the polling interval:
  - a. In the UnDP application interface, select an individual UnDP under *All Defined Pollers* (e.g. APCABOUTupsAdvBatteryExternalSKU).
  - b. Click **Edit Properties**.
  - c. On the **Define Your Universal Device Poller** dialog, click **Show Advanced Options**.
  - d. Set Polling Interval to the recommended number of minutes:
    - **About** and **Configuration** UnDP polling intervals: 600 minutes
    - **Status** UnDP intervals: 15 minutes

## Assign the Universal Device Pollers to Network Devices

Once imported, the UnDP files must be assigned to monitor the APC network devices:

1. In the UnDP interface, click the **Assign Pollers** button.
2. From the list of *All Pollers*, select the **About**, **Status** and **Configuration** Pollers, and click **Next>**.
3. From the list of *All Nodes*, select **American Power Conversion Corp.** to select all APC devices discovered during Network Sonar Discovery.
4. Click **Finish** to assign all imported pollers to all APC devices on the network.

## View SNMP Polling Data

Once assigned, the UnDPs will poll the APC devices on the network, at the interval specified during the import process. To view the SNMP data, it may be necessary to add Universal Device Poller status to your NPM device summary page. Perform these steps once to add the UnDP status page to your Summary page:

1. Log in to the NPM web interface.
2. Go to **Home > Summary > All Nodes** and select **American Power Conversion Corp.**, and click on an APC device node.
3. On the **Summary** page, click the **Customize Page** button to customize the Node Details view.
4. Under **Column 2**, click the **Add** symbol (+).
5. In the available resources field, search for **Universal Device Poller Status**, and select it in the results.
6. Click **Add to selected resources**
7. Prioritize **Universal Device Poller Status** to the top of **Column 2** using the arrows.
8. Click **Done** to save your configuration.

To view the SNMP data:

1. Go to **Home > Summary > All Nodes** and select **American Power Conversion Corp.**
2. Click on a device to view a summary of the SNMP data returned by the UnDPs assigned to that device. To refresh the status list, click **Poll Now**.
3. Click on the **Universal Device Poller** pane to view statistics on individual OIDs returned by the UnDPs.

## Assign Alert Actions

APC provides three Alert Action XML files that specify status thresholds for which you can configure alerts; see “Inventory” on page 4. You can configure alerts to occur when the UnDP SNMP data returned by the APC network devices exceeds the thresholds defined in the Alert Action files. To do this:

1. In the NPM web interface, go to the **Home > Alerts** tab.
2. Click **Manage Alerts**.
3. From the **Export/Import** dropdown, select **Import Alert**.
4. Navigate to the location of the Alert Action files downloaded from the APC website. See “Import the Universal Device Pollers” on page 6. Select an Action Alert file and click **Open**.
5. Repeat for all 3 Action Alert Files.

## Edit Trigger Conditions

You can edit the conditions by which an alert is triggered. In the Alert Action files provided by APC, the default trigger conditions are pre-defined to specify the vendor definition of **American Power Conversion Corp.** and the OID of the condition. For example, for the Battery Runtime less than ten minutes alert, the trigger condition is defined as `OID APCSTATupsAdvBatteryRunTimeRemaining`, and the value to less than ten minutes.

To configure the Alert Actions:

1. In the NPM web interface, go to the **Home > Alerts** tab.
2. Click **Manage Alerts**, and click on the Alert Action to be edited. The Alert Configuration Wizard opens.
3. Click on the **Trigger Actions** tab.
4. Click the **Add Action** button.
5. Select an action from the list that you want to occur once the Alert trigger condition is met. For example, *Send an Email/Page*. Click **Configure Action** to specify the settings for the action, e.g. the email settings of the recipient.



For detailed instructions on how to use the Alert Configuration Wizard, see the **SolarWinds NPM Administrator Guide** chapter “*Creating and Managing Alerts*” on the SolarWinds NPM support website.

## Import SNMP Trap Rules

SolarWinds NPM includes a Trap Viewer application to view and manage SNMP traps. To import the SNMP Trap Rules for your APC devices:

1. Download and save the *Managed Services Integration Kit for SolarWinds NPM* from **www.apc.com**, which includes three SNMP Trap Rule files. See “SNMP Universal Device Pollers, Trap Rules and Alert Actions” on page 4.
2. Open the NPM Trap Viewer.
3. Go to **File > Settings** and select the **Alerts/Filter Rules** tab.:
4. Click the **Import** button:
  - a. Navigate to the location where you saved the files in step 1.
  - b. Select a Trap Rule file and click **Open**.
  - c. Repeat for all Trap Rule files.
5. Click **OK** to save the Trap Rules and begin monitoring for SNMP Traps.

The SNMP Traps received by NPM from the APC devices on the network are displayed in the Trap Viewer. The traps are tagged by the severity (Informational, Warning and Severe) defined in the Trap Rule files. To see the tags, it may be necessary to edit the Trap Viewer user interface to show the Tag Column:

1. In Trap Viewer, go to **File > Settings**
2. On the **Displayed Columns** tab, select **Tag** and move it from the *All Trap Columns* pane to the *Selected Columns* pane.
3. Click **OK** to save.

You can also configure actions for SNMP Trap Rules:

1. In Trap Viewer, go to **File > Settings** and select the **Alerts/Filter Rules** tab.
2. Click on a Trap Rule and click **Edit**.
3. Select the **Alert Actions** tab.
4. Click the **Add Action** button to configure actions when an SNMP trap is received. You can Flag the Trap with a specific Color, Send an Email and more.



For detailed instructions on how to configure Trap Rules and use the Trap Viewer, see the **SolarWinds NPM Administrator Guide** chapter “*Monitoring SNMP Traps*” on the SolarWinds NPM support website.

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