



EMC® Watch4net®

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ICMP Collector Administration Guide

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Contents

Preface	iii
Purpose	iii
Intended Audience	iii
Prerequisites	iii
Document Organization	iv
Common Abbreviations and Acronyms	iv
Where to get help	v
1 Description	1
2 Installation	3
3 Configuration	7
1 Configuration example	7
2 Using the OPTIONAL PingFilter	12
3 Other configuration tips	13

Preface

Purpose

The purpose of this guide is to provide configuration and usage information about the ICMP Collector.

Intended Audience

APG administrators and system integrators, as well as users responsible of managing data collection configuration should read this document.

Prerequisites

- The *APG* collector manager must be installed. This collector module may be used with *APG* versions 5.0 and later.
- This collector currently runs only on Linux X86 and Sparc Solaris 9/10. Some Windows versions are known to work (Windows Server 2008, Windows Server 2003, Windows XP SP1) but it is not officially supported. Please consult “TCP/IP Raw Sockets” support for Windows on Microsoft’s website for updated information.
- Firewall rules must allow mass ping on the network, otherwise network device availability status will not be correctly collected.

- This APG collector must be run with user root (administrator) instead of APG. The apg-collector-manager-*.sh script must be modified for this to take place.
- The host running the Icmp Collector must be able to ping itself.

Document Organization

1. Description	A description of this collector function.
2. Installation	Instructions on how to install this collector.
3. Configuration	Instructions on how to configure this collector.

Common Abbreviations and Acronyms

Not Applicable There are no abbreviations used in this document.

Where to get help

EMC support, product, and licensing information can be obtained as follows:

PRODUCT INFORMATION - For documentation, release notes, software updates, or information about EMC products, go to EMC Online Support at:

<https://support.emc.com>

TECHNICAL SUPPORT - Go to EMC Online Support and click Service Center. You will see several options for contacting EMC Technical Support. Note that to open a service request, you must have a valid support agreement. Contact your EMC sales representative for details about obtaining a valid support agreement or with questions about your account.

1

Description

This APG collector is used to ping a list of hosts and determine if they are up (responding to ICMP echos) or down. This collector will attempt to poll all hosts within the specified period, while preserving system resources as much as possible by smoothing out the polling on the available time.

The values output by this collector are:

- Icmp echo round trip time (default name: icmpRtt): The average time for an icmp echo request response. This value is impacted by the drop-max-value setting.
- Icmp reachability ratio (default name: icmpReachability): The ratio of responses versus the number of pings sent to the target. Values are between 0 and 1. If one ping is specified, 0 or 1 is returned, which corresponds to basic Icmp availability.
- Optional: Icmp availability (default name: icmpOk): Indicates that the target answered any of the pings sent (value = 100) or none (value = 0). This can be set up by using a filter.

The list of hosts may either be a seedfile containing host ip addresses (one ip address per line) or a SNMP Collector snmp-polling-distribution.xml file.

2

Installation

The ICMP Collector module may be installed like any other module. The package name is: "icmp-collector". Use the module manager to install it.

Note: On Windows, the file rocksaw.dll must be copied from /APG/Collecting/ICMP-Collector/Default/lib into the WINDOWS/SYSTEM32 directory.

Then, edit the APG/Collecting/Collector-Manager/ <INSTANCE NAME> /conf/collecting.xml file (location may vary depending upon installation location and Collector-Manager instance name). Enable the ICMP collector adding it among declared collectors.

```
<?xml version="1.0" encoding="UTF-8"?>

<config ... >

    <connectors>
        <connector enabled="true" name="SomeConnector" ... />
    </connectors>

    <!-- Filters can pre-process data gathered by the collecting component. -->
    <filters>
        ... other filters
        <filter enabled="true" name="SomeFilter" next="SomeConnector" ... />
        ... other filters
    </filters>

    <!-- Collectors gather data from different Sources. -->
    <collectors>
        ... other collectors
        <collector enabled="true" name="ICMP-Collector" next="SomeFilter"
            type="IcmpCollector" config="ICMP-Collector/<INSTANCE_NAME>/conf/icmp-collector.xml" />
        ... other collectors
    </collectors>
</config>
```

The “icmp-collector.xml” configuration file should be located in the “APG/Collecting/ICMP-Collector/<INSTANCE NAME> /conf/” directory. This file will contain your customized configuration for this filter. Create and edit as explained in this document’s Configuration section.

In order to run properly, this collector must be run as root.

- Edit the “APG/Collecting/Collector-Manager/conf/unix-service.properties” and uncomment the “# apg.user=root”, “# jvm.param.1=-Djava.rmi.server.hostname=\$HOSTNAME\$” and “# jvm.param.2=-Dcom.sun.management.config.file=conf/stats.properties” lines.
- Regenerate the apg-collector-manager-* service by running “APG/bin/manage-modules.sh service install collector-manager (instance name)”.
- Restart the APG collector manager service by issuing “APG/bin/apg-collector-manager-default restart”.

WARNING: It is strongly recommended to use a distinct instance of the Collector-Manager to run the ICMP-

Collector. Some collectors, such as the APG-Self-Monitoring collector, are not designed to run as root.

Configuration

This section contains a configuration example as well as the description of the available configuration elements.

1 Configuration example

The default configuration file for this collector is `APG/Collecting/ICMP-Collector/Default/conf/icmp-collector.xml`. Let's use the following example in order to create a configuration for this filter:

```
<?xml version="1.0" encoding="UTF-8"?>
<icmp-collector-config xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="icmp-collector.xsd">
  <icmpPollingTask icmpPollingTaskName="Poll_every_4_minutes" localhostIp="0.0.0.0">
    <maxIcmpThreads>1</maxIcmpThreads>
    <periodicity>240</periodicity>
    <source-property>icmpCollector</source-property>
    <group>group</group>
    <target-property-name>ip</target-property-name>
    <variable-name>Latency</variable-name>
    <variable-name-reachability>Availability</variable-name-reachability>
    <!-- <targetsFile>conf/targetsFile1</targetsFile> -->
    <number-pings-sent>1</number-pings-sent>
    <ping-timeout>1000</ping-timeout>
    <use-resolved-name-as-target>false</use-resolved-name-as-target>
    <drop-max-value>false</drop-max-value>
    <ignore-first-ping-result>false</ignore-first-ping-result>
    <use-ping-filter>false</use-ping-filter>
    <snmp-polling-distribution>conf/snmp-polling-distribution.xml</snmp-polling-distribution>
    <reloadFilePeriodically>true</reloadFilePeriodically>
    <ICMPHeaderLength>5</ICMPHeaderLength>
    <ICMPDataByteLength>56</ICMPDataByteLength>
    <TotalPacketSize>84</TotalPacketSize>
  </icmpPollingTask>
</icmp-collector-config>
```

The basic provided configuration assumes the following:

- 1 thread: this is enough for a small POC (10-15 devices).
- 4 minute polling period. May be set to 5 minutes to match other SNMP or SMARTS metrics collection.
- Source name is icmpCollector : this value appears in the raw values source property.
- Raw values are pushed in group named “group”, the standard APG retention group.
- Raw values properties are: ip, name. device is specified in the snmp-polling-distribution.xml file, so is devtype.
- Raw values output are: Latency and Availability.
- number-pings-sent: 1. 3 retries (the number of retries is hardcoded).
- The Ping Filter is not used by default, as the `< use - ping - filter >` element is set to false.

- Reload the target host file (targetFile or snmp-polling-distribution.xml) on every period.

No editing is needed if this suits your requirements. If you are not using the SNMP Collector, please use a `< targetsFile >` instead of the `< snmp – polling – distribution >` file.

Elements and attributes are as follows:

At least one `< icmpPollingTask >` must be defined. Attributes are:

- icmpPollingTaskName: The name of the icmp polling task (recommended).
- localhostIP: The collector's host IP address. (mandatory) This specifies which interface will be used to ping the targets. Use 0.0.0.0 to let the kernel choose a suitable interface. A specific interface may be set to force polling through a given route.

Elements in `< icmpPollingTask >` are:

- maxIcmpThreads: The number of threads to be used in the `< icmpPollingTask >`. Should be more than 1, but no more than the number of hosts to poll in this icmpPollingTask. 1 is enough for a small POC but a higher value shall be used when polling more than 30 devices. As a rule of thumb, consider the maximum time taken to poll one host, which is: the number of pings * 3 tries * timeout. Then multiply this by the number of hosts and the result is the approximate time taken when using one thread. Thread counts should be increased if this result exceeds 50 percent of the polling period.
- periodicity: The polling period, in seconds.
- source-property: The value of the generated raw value's source property.
- group: the raw value's retention group.
- target-property-name: the name of the property which contains the target value in the raw value. In this case: ip
- variable-name: The value of the name property, for the icmp echo round trip time (rtt) raw value. In this case: name="Latency".
- variable-name-reachability: The value of the name property, for the icmp echo reachability ratio raw value. In this case: name="Availability".
- number-pings-sent: The number of pings to send in order to calculate an average icmp rtt. Minimum is 1.
- targetsFile: the full path of the targets file. Optional, if an independent target file is used. Do not specify a `< snmp – polling – distribution >` if used. This file simply contains IP addresses or resolvable host names, one per line.
- number-of-pings: the number of pings to send. Currently, this is set to 1, with 1 retry. Other values will have no effect.

- ping-timeout: The time out before the ping request fails.
- use-resolved-name-as-target: When set to true, the resolved name will be use as the target property value. When set to false, the ip address will be used instead.
- drop-max-value: When set to true, do not take into account the maximum rtt value when calculating the average rtt.
- ignore-first-ping-result: do not take into account the first icmp echo result in either average or reachability calculation.
- use-ping-filter: SET TO FALSE WHEN NOT USING THE PING FILTER. True to use it. Setting this to true allows NaN values to be output to the ping filter. Such values should not be sent directly to the backend, and must be handled by the ping filter.
- snmp-polling-distribution: path to the snmp-polling-distribution.xml file, if used. Do not specify a *< targetsFile >* if used.
- snmp-slave-poller-name: name of the snmp-slave-poller in which the hosts to poll are defined. This is optional. When not specified, the first one is used. Normally, this should not be specified, unless in the case of distributed snmp and icmp polling. In this case, the snmp collector will poll only the agents linked to it.
- reloadFilePeriodically: read the target host file (targetsFile or snmp-polling-distribution.xml) before every polling.
- ICMPIPHeaderLength: Set the number of 32bit words in the ICMP IP Header. This is optional. Default value is 5.
- ICMPDataByteLength: Set the number of bytes in the ICMP data packet. This is optional. Default value is 56.
- TotalPacketSize: Set the total packet length. This is optional. Default value is 84.

Note: The path to the snmp-polling-distribution.xml file must be either relative or absolute. The snmp-polling-distribution.xml should not be in icmp-collector module configuration directory.

These agents are defined in snmp-polling-distribution, in the `< snmp - slave - pollername = "Watch4NetSnmpCollector - 1" ... >` element, where Watch4NetSnmpCollector-1 is the name of the snmp collector. The icmp collector must also specify this name in order to use the same agents.

Note: Using a simple seed file to define host targets will result in having raw values with very few properties, such as source, name and ip. Using the snmp-polling-distribution.xml will provide those as well as the device and devtype properties. Keep in mind that it is also possible to add further properties coming from other sources by using the "cross-referencing-filter".

2 Using the OPTIONAL PingFilter

The PingFilter may be used with the ICMP Collector to output a “icmpOk” metric. This “icmpOk” metric value depends upon the icmpRtt result:

- icmpOk = 0 when the icmpRtt is NaN (not a number).
- icmpOk = 100 when the icmpRtt is a number.

The PingFilter must be declared in the collecting.xml file, like any other filter:

```
<?xml version="1.0" encoding="UTF-8"?>
<config ...>
  <connectors>
    ... connector already defined ...
  </connectors>
  <filters>
    ... next filter ...
    <filter enabled="true" name="PingFilter" next="NextFilter" type="PingFilter"
      config="ICMP-Collector/Default/PingFilter/conf/ping-filter.xml" />
    ... previous filter ...
  </filters>
  <collectors>
    ... next filter ...
    <filter enabled="true" name="ICMP-Collector" next="PingFilter" type="IcmpCollector"
      config="ICMP-Collector/Default/conf/icmp-collector.xml" />
    ... previous filter ...
  </collectors>
```

The PingFilter configuration file (default configuration file is: “APG/Collecting/ICMP-Collector/ <INSTANCE NAME> /PingFilter/conf/ping-filter.xml”) is very simple:

```
<?xml version="1.0" encoding="UTF-8"?>
<ping-filter-config xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="ping-filter.xsd" namePropertyValue="Latency" newRawValueName="
icmpOk"
  dropWhenNamePropertyValueIsNaN="true" />
```

This is a typical setup for use with the Icmp Collector: Intercept all values that have their name=“icmpRtt”. Pushes an extra raw value with name=“icmpOk”: 0 when icmpRtt=NaN (set icmpRtt to 0 afterwards), 100 when icmpRtt != NaN

- namePropertyValue: apply filter only on raw values that have this name property value. (i.e. name=“icmpRtt”)

- **newRawValueName:** A new raw value, with name="icmpOk" will be generated by filter. It's value will be 100 when the icmpRtt's value differs from NaN. icmpRtt=NaN means the icmp request has failed.
- **dropWhenNamePropertyValuesIsNaN:** When set to true, this tells the filter to drop the icmpRtt value when it's value is NaN. This is the recommended setting and should be left to true.

Note: This filter is required only when the icmpOk variable is required, success being defined as a successful response from the target to any ping request. This filter is not usually required as its behavior can be easily reproduced by using an APG Frontend formula, using the Availability metric.

3 Other configuration tips

As mentioned earlier in this document, the raw values output by this collector have the following properties:

- **group:** the retention group;
- **name:** the metric name;
- **ip:** the device ip;
- **source:** the collector source-property value.

In a typical default setup, the following properties are provided by merging data coming from the SNMP Collector through a Cross Referencing Filter:

- **device:** the device name;
- **contact:** the device syscontact;
- **location:** the device location;
- **devtype:** the device type;

If one wants to use the ICMP Collector without using the SNMP Collector to gather further information about the devices being pinged, it is still possible to add property values to the raw values output by the ICMP Collector by using a Property Tagging Filter.