



Pulse Secure

SNMP Monitoring Guide

Applicable for

**Pulse Secure Appliance
PCS/PPS/PSA-V**

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Pulse Secure SNMP Monitoring Guide
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Overview

This document describes guidelines for SNMP monitoring of Secure Access devices' health and stability. The MIB OIDs and functions in the tables provided are from the Pulse Secure MIB and UC Davis MIB.

Most objects explained in this document are also included in the Pulse Secure PCS/PPS Software Administration Guide. The Pulse Secure MIB has all the necessary objects that can be used for monitoring most of the components while the UCD MIBs has a few useful objects and is added for information. Standard SNMPv2 MIB is also supported but not included in this document.

Procedure

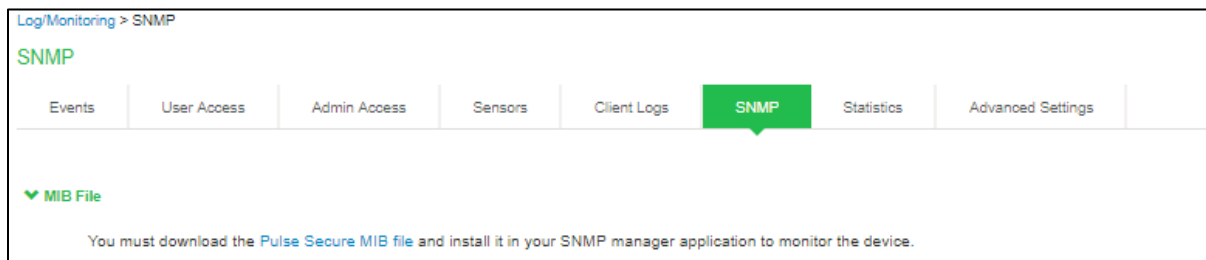
1. Download the Pulse Secure MIB from the device Admin UI SNMP page. This has most of the objects for MAG/SA SNMP monitoring (See NOTES below).
2. To monitor system statistics, such as memory utilization, load the UC-Davis MIB file into the SNMP manager application. You can obtain the MIB file from:

<http://net-snmp.sourceforge.net/docs/mibs/UCD-SNMP-MIB.txt>

3. Install the MIBS to monitor your device and use the OIDs described in the tables shown later in this document.

NOTES

- SMMPv2 standard MIB and the UCDavis MIB are supported, but most of the needed objects for monitoring stability are already available through the Pulse Secure MIB downloadable from the Admin UI SNMP page.



- Safe and critical values are essential guides to assist in establishing some monitoring. Adjustments may be necessary depending on configurations to be done on the devices but most of the values are known best practice values and recommendations.

Common Objects for SNMP Monitoring of PSA (PCS/PPS) Devices

Below are most of the objects that can be used for monitoring the health of an PCS/PPS/PSA-V system.

NOTE: A full list of objects can be found in the 9.0R4 admin guide (pages 823-829) located at <http://www.pulsesecure.net/techpubs/>

Table : Pulse Secure MIB

Component	OID	Description	Trap	Poll	More Information
USERS	.1.3.6.1 .4.1.12 532.2. 0	Number of signed-in web users		Y	Monitors users connected and uses the web feature. Not critical in monitoring health: informational only.
	.1.3.6.1 .4.1.12 532.12 .0	Total number of users logged in to the PCS/PPS node		Y	Monitors the number of users in this node that are logged in. Not critical in monitoring health: informational only.
	1.3.6.1. 4.1.12 532.13 .0	Total number of users logged in to the Cluster		Y	Monitors the number of users in the cluster that are logged in. This number counts towards the user licenses. Not critical in monitoring health: informational only.
	.1.3.6.1 .4.1.12 532.52	Total number of named users logged in to the node		Y	Monitors the number of named users in the node that are logged in. This number counts towards the named user license.
	.1.3.6.1 .4.1.12 532.25 1.6	Maximum number of concurrent users signed in	Y		Traps based on Admin UI settings (see Figure 1). Setting determined by the administrator. Critical trap to inform that the user license limit is reached.
	.1.3.6.1 .4.1.12 532.9. 0	The number of concurrent meeting users	Y		Monitors the number of secure meeting users connected. This number counts towards Secure Meeting license, cannot be queried and accessed for notification only via trap. Not critical in monitoring health: informational.

Component	OID	Description	Trap	Poll	More Information
	.1.3.6.1 .4.1.12 532.25 1.17	Concurrent meeting count over license limit	Y		Traps based on Admin UI settings (see Figure 1). Setting determined by the administrator. Critical trap to inform that the user license limit is reached.
	.1.3.6.1 .4.1.12 532.25 1.42	Maximum number of named users signed in	Y		Traps based on named users to determine the number of users signed in.

COMPONENT	OID	DESCRIPTION	TRAP	POLL	MORE INFORMATION
MEMORY	.1.3.6.1.4.1.12532.11.0	The Memory Utilization of the PCS/PPS system		Y	<p>Depending on the load and features used:</p> <p><90% is normal</p> <p>90-95% is high but not necessarily an issue</p> <p>ACTION: Start monitoring swap</p> <p>95-99% is very high but not necessarily will cause immediate issue</p> <p>ACTION: Start monitoring swap</p>
	.1.3.6.1.4.1.12532.251.21	PCS/PPS memory utilization above threshold	Y		<p>Traps based on Admin UI settings (see Figure 1)</p> <p>See also above for safe usage.</p> <p>ACTIONS: Set the Memory trap setting in UI to very high (95% to 99% as Linux systems can use most of physical memory and does not fully indicate issues.</p> <p>Start monitoring swap for usage when trap starts to be generated. **SEE NOTES</p>
	.1.3.6.1.4.1.12532.24.0	The Swap Utilization of the PCS/PPS system		Y	<p>0% is normally what swap usage should be.</p> <p>From 5% of swap usage, it needs monitoring</p> <p>ACTION: If swap starts to be utilized, get logs. **SEE NOTES</p>
	.1.3.6.1.4.1.12532.251.23	PCS/PPS swap utilization above threshold	Y		<p>Same as above</p> <p>ACTION: Recommended to set to 5%. When trapping starts, get logs. **SEE NOTES</p>
CPU	.1.3.6.1.4.1.12532.10.0	The CPU Utilization of the PCS/PPS system		Y	<p>Depending on the load and features used:</p> <p><50% is usually normal</p> <p>Above or steady at 80%, especially during peak times, may indicate load issue.</p>

COMPONENT	OID	DESCRIPTION	TRAP	POLL	MORE INFORMATION
					<p>100% is abnormal and needs investigation</p> <p>Sudden jump leading to 100% is not normal when it does not come down within few minutes.</p> <p>CPU of 100% steady is not normal.</p> <p>ACTION: Check usage, throughputs from graphs and re-evaluate capacity. Get logs. **SEE NOTES</p>
	.1.3.6.1.4.1.12532.251.22	PCS/PPS CPU utilization above threshold	Y		<p>Traps based on Admin UI settings (see screenshot*)</p> <p>See above for CPU values.</p> <p>It is recommended to not set CPU trap until the normal CPU usage is known.</p> <p>ACTION: If it is known, set CPU trap to default of 80% in admin SNMP page. If it traps at 80% consistently, get logs.</p> <p>See Figure 1 and "NOTES ON LOGS" later in this document.</p>
DISK	.1.3.6.1.4.1.12532.25.0	Percentage of disk space		Y	<p><80% is normal</p> <p>80% and above needs close monitoring</p> <p>90% and above is critical</p> <p>ACTION: If disk space percentage starts to go over 80%, gather logs</p> <p>See "NOTES ON LOGS" later in this document.</p>
	.1.3.6.1.4.1.12532.251.18	Disk space nearly full	Y		<p>Traps based on Admin UI settings (see Figure 1)</p> <p>ACTION: Recommended to set to 90%. If it continuously traps, start monitoring and gathering logs.</p> <p>See "NOTES ON LOGS" later in this document.</p>

COMPONENT	OID	DESCRIPTION	TRAP	POLL	MORE INFORMATION
					Backup and delete logs immediately, delete all snapshots if seen. Clear out debuglogs if set to high value, call PSGSC for assistance.
	.1.3.6.1.4.1.12532.251.19	Disk space full	Y		<p>Disk usage has gone 100%.</p> <p>This is a critical issue as this will eventually crash box.</p> <p>ACTION: Backup and delete logs immediately, delete all snapshots if seen. Clear out debuglogs if set to high value, call PSGSC for assistance. Getting more logs may not work due to space exhausted.</p>
LOG	.1.3.6.1.4.1.12532.1.0	Percentage of log file full		Y	<p>This reading can help determine if archiving is needed or modified.</p> <p>Not critical in monitoring health: informational.</p>
	.1.3.6.1.4.1.12532.251.4	Log file nearly full	Y		<p>This reading can help determine if archiving is needed or modified.</p> <p>Not critical in monitoring health: informational</p>
TEMPERATURE	.1.3.6.1.4.1.12532.42.0	The Temperature of MAG application blade		Y	<p>This is a critical information for stability of the chassis/ blades</p> <p>< 75 deg C is normal</p> <p>From 70 deg C, monitor temperature closely as a precaution</p> <p>75 deg C and above is not normal and will fire a trap</p> <p>ACTION: Check admin UI temperature to confirm, check other blades as well, check fans and status of LEDs, get outputs from CMC CLI (if used) commands to get status of each blades and alarms. Call PSGSC.</p>

COMPONENT	OID	DESCRIPTION	TRAP	POLL	MORE INFORMATION
	.1.3.6.1.4.1.12532.251.35	IVE Temperature is above threshold	Y		<p>This is a critical trap</p> <p>Traps at 75 deg C</p> <p>ACTION: Check admin UI temperature to confirm, check other blades as well, check fans and status of LEDs, get outputs from CMC CLI (if used) commands to get status of each blades and alarms. Call PSGSC.</p>
POWER SUPPLIES	.1.3.6.1.4.1.12532.251.27	The status of the power supplies has changed	Y		<p>This is a critical trap to know fan status, which is any of the following:</p> <p>“Both the power supplies are back up”</p> <p>“One of the power supplies has failed”</p> <p>ACTION: Investigate further and call PSGSC.</p>
FANS	.1.3.6.1.4.1.12532.251.26	The status of the fans has changed	Y		<p>This is a critical trap to know fan status, which is any of the following:</p> <p>“Fan N is running above threshold (xyz RPM)”</p> <p>“Fan N is running below threshold (xyz RPM)”</p> <p>“Both the fans are back up”</p> <p>“Both the fans have failed”</p> <p>“One of the fans has failed”</p> <p>ACTION: Investigate further and call PSGSC</p>
HARD DRIVES	.1.3.6.1.4.1.12532.251.28	The status of the RAID has changed	Y		<p>This is a critical trap to know RAID status, which is any of the following:</p> <p>“The RAID status is OK”</p> <p>“The RAID status is recovering”</p> <p>“The RAID status is unknown”</p> <p>“The RAID status is failed”</p> <p>ACTION: Investigate further and call PSGSC.</p>

COMPONENT	OID	DESCRIPTION	TRAP	POLL	MORE INFORMATION
NETWORK INTERFACES	.1.3.6.1.4.1.12532.251.33	The Internal interface has gone down, reason is in nicEvent	Y		This is a critical trap ACTION: Investigate further
	.1.3.6.1.4.1.12532.251.34	The Management interface has gone down, reason is in nicEvent	Y		This is a critical trap ACTION: Investigate further
	.1.3.6.1.4.1.12532.251.31	The External interface has gone down, reason is in nicEvent	Y		This is a critical trap ACTION: Investigate further

UC DAVIS MIB:

COMPONENT	OID	DESCRIPTION	TRAP	POLL	MORE INFORMATION
MEMORY	.1.3.6.1.4.1.2021.4.11.0	Total Available Memory on the host		Y	Compared to Pulse Secure MIB, this reads size in Bytes or M bytes so it needed to be converted to percentage. Depending on the load and features used (% of total memory of system): <90% is normal 90-95% is high but still fine ACTION: Start monitoring swap 95-99% is very high but not necessarily will cause immediate issue ACTION: Start monitoring swap
	.1.3.6.1.4.1.2021.4.4.0	Available Swap Space on the host.		Y	Compared to Pulse Secure MIB, this reads size in Bytes or Mbytes. Can be computed in percentage, like Pulse Secure MIB: From 5% of swap usage, it needs monitoring 0% is normally what swap usage should be.

COMPONENT	OID	DESCRIPTION	TRAP	POLL	MORE INFORMATION
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ACTION: If swap starts to be utilized, get logs.

See "NOTES ON LOGS" later in this document.

Component	OID	Description	Trap	Poll	More Information
PCLS	.1.3.6.1 .4.1.12 532.54	Number of days remaining in grace period for contacting PCLS		Y	Monitors the number of days remaining in grace period for contacting PCLS.

CRITICAL/MAJOR EVENTS

Monitoring "Critical" and "Major" events augments the polling and trapping values obtained from the available OIDs supported in the system. There are log messages that are important to monitor as well, and both "Critical" (Level 10) and "Major" (Level 8-9) are available for use in SNMP monitoring. The list of logs can be obtained from Pulse Secure Global Support Center.

Some examples are:

SYS10047	SystemStatus	ClusterMsg	InternalInterfaceDown	10	internal NIC down.
SYS10049	SystemStatus	ClusterMsg	ExternalInterfaceDown	10	external NIC down.
SYS10051	SystemStatus	ClusterMsg	InternalGatewayDown	10	internal gateway '%1' unreachable.
SYS10053	SystemStatus	ClusterMsg	ExternalGatewayDown	10	external gateway '%1' unreachable.
ERR20643	SystemError	Misc	RestartSvc	10	Watchdog restarting services (%1).
ERR30431	SystemError	Misc	RestartProcesses	10	Watchdog restarting %1 processes (%2).

The Critical Log events and Major Log events can be included in SNMP monitoring by checking the options in the SNMP page as shown in Figure 1.

Figure 1: Screenshot of SNMP Options:

▼ Trap Thresholds

Set thresholds for traps.

Check Frequency:	<input type="text" value="180"/>	seconds (60-1800 seconds)		
Log Capacity:	<input type="text" value="90"/>	%	Disk:	<input type="text" value="80"/>
Users:	<input type="text" value="100"/>	%	CPU:	<input type="text" value="0"/>
Physical Memory:	<input type="text" value="0"/>	%	Meeting Users:	<input type="text" value="100"/>
Swap Memory (Virtual Memory):	<input type="text" value="0"/>	%		

To monitor the device for memory starvation condition it is recommended to use 'Virtual Memory' traps as Physical memory traps may get generated even if the device is not showing symptoms of memory starvation.

▼ Optional traps

- Critical Log Events
- Major Log Events

[Save Changes](#)

NOTES ON LOGS

Log needed at the minimum from the PCS or PPS devices or PSA-V Virtual instances.

- System snapshot (**Troubleshooting > System Snapshot > (select to include debug log and configs) > Take snapshot**)
- PCS/PPS logs (**Log/Monitoring > Events logs > Save all logs**)
- Screenshot of the cockpit graph detailing issue time and readings without cropping (showing date information)