SNMP MONITORING GUIDE

APPLICABLE TO: SRX Platforms

SUMMARY:
This document describes guidelines on monitoring SRX Devices for health and stability via SNMP.

PROCEDURE:

1. Download Junos Enterprise MIBS from Junos Download site by selecting a Junos product and Junos version. Select the Software Tab and under Application & Tools you will locate the Enterprise Mibs. (Note the Junos MIB file is applicable to all Junos products and contains a TGZ of both Standard as well as Junos Enterprise MIBs)

   http://www.juniper.net/support/downloads/junos.html


3. Install MIBS to monitoring device

4. Setup Junos for SNMP Queries


   http://kb.juniper.net/InfoCenter/index?page=content&id=KB16545

NOTES:

- Safe and critical values are essentially 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.

- SNMP OID query responses may include responses for different parts of the device. To understand the mapping correlation of the response IDs to device components use SNMP OID jnxOperatingDescr (1.3.6.1.4.1.2636.3.1.13.1.), part of the Juniper Enterprise MIB mib–jnx–chassis.

  Example:
  Using OID jnxOperatingDescr a user can locate the system component IDs to allow mapping to SNMP query outputs.
root@srx_650> show snmp mib walk 1.3.6.1.4.1.2636.3.1.13.1.5
jnxOperatingDescr.1.1.0.0 = node0 midplane
jnxOperatingDescr.2.1.0.0 = node0 PEM 0
jnxOperatingDescr.4.1.0.0 = node0 SRXSME Chassis Fan Tray
jnxOperatingDescr.7.1.0.0 = node0 FPC: FPC @ 0/*/*
jnxOperatingDescr.7.2.0.0 = node0 FPC: FPC @ 1/*/*
jnxOperatingDescr.7.3.0.0 = node0 FPC: FPC @ 2/*/*
jnxOperatingDescr.7.7.0.0 = node0 FPC: FPC @ 6/*/*
jnxOperatingDescr.7.8.0.0 = node0 FPC: FPC @ 7/*/*
jnxOperatingDescr.7.9.0.0 = node0 FPC: FPC @ 8/*/*
jnxOperatingDescr.8.1.1.0 = node0 PIC: 4x GE Base PIC @ 0/0/*
jnxOperatingDescr.8.3.1.0 = node0 PIC: 16x GE POE gPIM @ 2/0/*
jnxOperatingDescr.8.7.1.0 = node0 PIC: 2x 10G xPIM @ 6/0/*
jnxOperatingDescr.8.8.1.0 = node0 PIC: 2x CT1E1 gPIM @ 7/0/*
jnxOperatingDescr.8.9.1.0 = node0 PIC: 4x CT1E1 gPIM @ 8/0/*

Using the above knowledge of the Routing Engine having ID 9.1.0.0, it can be applied when looking at responses for queries related to the Routing Engine such as SNMP polling for CPU usage.

root@srx_650> show snmp mib walk 1.3.6.1.4.1.2636.3.1.13.1.8
jnxOperatingCPU.1.1.0.0 = 0
jnxOperatingCPU.2.1.0.0 = 0
jnxOperatingCPU.4.1.0.0 = 0
jnxOperatingCPU.7.1.0.0 = 0
jnxOperatingCPU.7.2.0.0 = 0
jnxOperatingCPU.7.3.0.0 = 0
jnxOperatingCPU.7.7.0.0 = 0
jnxOperatingCPU.7.8.0.0 = 0
jnxOperatingCPU.7.9.0.0 = 1
jnxOperatingCPU.8.1.1.0 = 0
jnxOperatingCPU.8.3.1.0 = 0
jnxOperatingCPU.8.7.1.0 = 0
jnxOperatingCPU.8.8.1.0 = 0
jnxOperatingCPU.8.9.1.0 = 1

jnxOperatingCPU.9.1.0.0 = 9  <-9% usage
jnxOperatingCPU.9.1.1.0 = 0
jnxOperatingCPU.9.1.2.0 = 0

root@srx_650> show chassis routing-engine | find "CPU utilization"
CPU utilization:
  User 5 percent
  Background 0 percent
  Kernel 4 percent
  Interrupt 0 percent
  Idle 91 percent

9% usage

Model RE-SRXSME-SRE6
Serial ID ZQZQ7481
Start time 2013-10-31 18:57:06 UTC
Uptime 19 hours, 26 minutes, 5 seconds
Last reboot reason 0x200: normal shutdown
Load averages: 1 minute 5 minute 15 minute
  0.10 0.08 0.08
COMMON OBJECTS FOR SNMP MONITORING:

Below are objects that can be used for monitoring the health of an SRX device and capacity.

NOTE: A full list of objects that can be monitored for SRX devices is available at the following locations:

SRX Branch MIB Reference

gateway.pdf

SRX 1400 & SRX–3X00 MIB Reference

gateway.html

SRX 5X00 MIB Reference

srx5800–snmp-mib-reference/index.html

JUNIPER MIB:

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>OID</th>
<th>DESCRIPTION</th>
<th>TRAP</th>
<th>POLL</th>
<th>MORE INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SESSIONS</td>
<td>1.3.6.1.4.1.2636.3.39.1.12.1.1.1.9</td>
<td>SRX–HE</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum CP Session availability</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>CLI:</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>show security</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Maximum Device Session capacity (Dependent upon # of SPCs installed in system)
<table>
<thead>
<tr>
<th>OID</th>
<th>Description</th>
<th>Status</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1.3.6.1.4.1.2636.3.39.1.12.1.1.1.8 | Current CP Session Count | Y | Current CP Session usage.  
< 80% of Max CP sessions  
80–90% of Max may be considered normal depending upon network traffic but requires investigation if increase is sudden  
>90% Reaching Device limits |

**CLI:**  
show security flow cp–session summary

**ACTION:**  
- Review traffic patterns  
- Review sessions numbers on PFE  
- Review SRX Device type for capacity needs

<table>
<thead>
<tr>
<th>OID</th>
<th>Description</th>
<th>Status</th>
<th>Action</th>
</tr>
</thead>
</table>
| 1.3.6.1.4.1.2636.3.39.1.12.1.1.1.7 | Maximum session availability per PFE | Y | SRX–HE has multiple SPU forwarding engines  
SRX–Branch has 1 PFE with maximum device capability based this value |

**CLI:**  
show security flow cp–session summary
<table>
<thead>
<tr>
<th>Metric</th>
<th>OID</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Flow Session Count</td>
<td>1.3.6.1.4.1.2636.3.39.1.12.1.1.1.6</td>
<td>(jnxJsSPUMonitoringCurrentFlowSession)</td>
<td>Y &lt; 80% of Max PFE Sessions Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Current PFE Session Count</td>
<td>80% – 90 of Max PFE Sessions may be considered normal depending upon network traffic but requires investigation if increase is sudden</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;90% Reaching Device limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACTION:</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Review traffic patterns</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Look for sessions with high inactivity timeouts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Review Device type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For SRX HE– Review SPC needs</td>
</tr>
<tr>
<td>CPU Usage</td>
<td>1.3.6.1.4.1.2636.3.1.13.1.8</td>
<td>(jnxOperatingCPU)</td>
<td>Y &lt;85% No Action</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CPU usage of Routing Engine</td>
<td>85–95% Active Investigation recommended if increase is sudden or sustained on upper range</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;95% Device responsiveness for self traffic is likely</td>
</tr>
<tr>
<td>Metrics</td>
<td>Description</td>
<td>Status</td>
<td>Action</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>1.3.6.1.4.1.2636.3.39.1.12.1.1.1.4 (jnxJsSPUMonitoringCPUUsage)</td>
<td>SRX HE &amp; Branch CPU Usage of Packet Forwarding Engine</td>
<td>Y</td>
<td>&lt; 80% No Action, 85–95% Active Investigation recommended if increase is sudden or sustained on upper range, &gt;95% Device responsiveness for transit traffic is likely to be impacted including session buildup</td>
</tr>
<tr>
<td>MEMORY 1.3.6.1.4.1.2636.3.1.13.1.11 (jnxOperatingBuffer)</td>
<td>SRX-HE Used memory % for Routing Engine</td>
<td>Y</td>
<td>&lt; 80% No Action, 80–95% Memory usage high and may impact system updates such as IDP route table additions</td>
</tr>
</tbody>
</table>
show chassis routing-engine

>95% Device will begin active memory clean up attempts

**ACTION:**
- Verify routing table size
- Verify System Processes in use
- Review system logs

<table>
<thead>
<tr>
<th>1.3.6.1.4.1.2636.3.1.13.1.11 (jnxOperatingBuffer)</th>
<th>SRX-Branch Used memory % for Routing Engine</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>CLI:</em> show chassis routing-engine</td>
<td>Y</td>
</tr>
</tbody>
</table>

Output is Total Device Memory usage including PFE Usage.

To Calculate RE Usage

For 1GB Systems

\[
\text{RE Usage} = \left(\text{jnxOperatingBuffer} \times 1024\right) - \left(\text{jnxJsSPUMonitoringMemoryUsage} \times 464\right)/560
\]

For 2GB Systems

\[
\text{RE Usage} = \left(\text{jnxOperatingBuffer} \times 2048\right) - \left(\text{jnxJsSPUMonitoringMemoryUsage} \times 944\right)/1104
\]

< 80% No Action

80–95% Memory
<table>
<thead>
<tr>
<th>SRX HE &amp; Branch</th>
<th>Packet Forwarding Memory Usage</th>
<th>Y</th>
<th>&lt; 80% No Action</th>
</tr>
</thead>
</table>
| 1.3.6.1.4.1.2636.3.39.1.12.1.1.1.5  
(jnxJsSPUMonitoringMemoryUsage) |  
| CLI: |  
show security monitoring fpc |  
| | | | >95% Transit traffic may be impacted due to inability for forwarding operations |
| | | | ACTION: |
| | | | Review system logs |
| | | | Verify configuration for unused features |
| NAT–SOURCE | 1.3.6.1.4.1.2636.3.39.1.7.1.0 (jnxJsNatAddrPoolThresholdStatus) | SRX HE & Branch | Y | Recommendation to set trap for rising threshold of 80%. ACTION:
Verify traffic patterns
Check for sessions with high timeout values
Increase NAT IPs
Implement Active/Passive PFE (for Chassis Clusters)
Implement overflow–pool usage |
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.3.6.1.4.1.2636.3.39.1.7.1.1.3.1.2 (jnxJsNatIfSrcPoolTotalSinglePorts)</td>
<td>SRX HE &amp; Branch</td>
<td>Y</td>
<td>Amount of available pools dependent upon device type</td>
</tr>
<tr>
<td></td>
<td>1.3.6.1.4.1.2636.3.39.1.7.1.1.3.1.3</td>
<td>SRX HE &amp;</td>
<td>Y</td>
<td>&lt;80% of ports in</td>
</tr>
<tr>
<td>(jnxJsNatIfSrcPoolAllocSinglePorts)</td>
<td>Branch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount of Ports per Overload Pool in use when using Interface Nat translation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLI: show security nat interface-nat-ports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>&gt;80% of ports in use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor if usage is always in this range, active investigation needed if sudden spike</td>
</tr>
<tr>
<td>100% of ports in use</td>
</tr>
<tr>
<td>Session creation failure will be seen</td>
</tr>
</tbody>
</table>

**ACTION:**

- Verify Traffic Pattern
- Check for sessions with high timeout values
- Implement Active/Passive PFE (for Chassis Clusters)
- Move to Source Nat with Pool Usage including Overflow Pool usage

<table>
<thead>
<tr>
<th>1.3.6.1.4.1.2636.3.39.1.7.1.1.4.1.1</th>
<th>SRX HE &amp; Branch Source Nat Pool Name.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Used to match Pool usage to Source Pool Name</td>
</tr>
</tbody>
</table>

**CLI:**

- show security nat interface-nat-ports
| 1.3.6.1.4.1.2636.3.39.1.7.1.1.4.1.5 (jnxJsNatSrcNumPortInuse) | SRX HE & Branch  
Ports in use when using Source-Nat Pool with PAT  
CLI:  
show security nat pool all | Y | <80% of ports in use  
>80% of ports in use  
Monitor if usage is always in this range, active investigation needed if sudden spike  
100% of ports in use  
Session creation failure will be seen  
ACTION:  
Verify Traffic Pattern  
Check for sessions with high timeout values  
Implement Active/Passive PFE (for Chassis Clusters)  
Increase IPs in pool  
Implement source pool port–overloading–factor  
Implement Pool Overflow |
<table>
<thead>
<tr>
<th>TEMPERATURE</th>
<th>1.3.6.1.4.1.2636.4.1.3 (jnxOverTemperature)</th>
<th>SRX HE &amp; Branch</th>
<th>Y</th>
<th>ACTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trap raised when a device is reading</td>
<td></td>
<td></td>
<td>Review ambient temperature</td>
</tr>
<tr>
<td></td>
<td>high temperatures</td>
<td></td>
<td></td>
<td>Verify fan status</td>
</tr>
<tr>
<td></td>
<td>CLI:</td>
<td></td>
<td></td>
<td>Verify if all components reporting high temperatures</td>
</tr>
<tr>
<td></td>
<td>show chassis environment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1.3.6.1.4.1.2636.4.2.3 (jnxTemperatureOK)</th>
<th>SRX HE &amp; Branch</th>
<th>Y</th>
<th>ACTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Recovery of Temperature</td>
<td></td>
<td></td>
<td>Monitor for repeat occurrence of high temperature reporting</td>
</tr>
<tr>
<td></td>
<td>CLI:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>show chassis environment</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1.3.6.1.4.1.2636.3.1.13.1.7 (jnxOperatingTemp)</th>
<th>SRX HE &amp; Branch</th>
<th>Y</th>
<th>Spikes in temperature are expected as device will vary fan speeds based on temperature and length of temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Temperature of device and modules</td>
<td></td>
<td></td>
<td>There are many temperature thresholds values depending upon device and module</td>
</tr>
<tr>
<td></td>
<td>CLI:</td>
<td></td>
<td></td>
<td>Important items to watch for are:</td>
</tr>
<tr>
<td></td>
<td>show chassis environment</td>
<td></td>
<td></td>
<td>SRX5k– RE, FPC (SPC/IOC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SRX3k – CB, SFB (FPC0).</td>
</tr>
<tr>
<td>Component</td>
<td>Object Identifier</td>
<td>SRX-HE and SRX-650-550</td>
<td>Y (%)</td>
<td>Investigation Needed</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------</td>
<td>------------------------</td>
<td>-------</td>
<td>----------------------</td>
</tr>
<tr>
<td>POWER SUPPLY</td>
<td>1.3.6.1.4.1.2636.4.1.1 (jnxPowerSupplyFailure)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The status of a power supply</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ACTION:**
- Verify power input

Use cli `show chassis temperature thresholds` to view thresholds for recommended thresholds.

**ACTION:**
- Check status of Fans
- Check ambient temperature and device spacing requirements
- For SRX3k - Re-arrange card placement (Avoid SPC next to SPC in left to right fashion, or place SPC next to fan input edge if possible)
has changed
CLI:
show chassis environment pem

| FAN | 1.3.6.1.4.1.2636.4.1.2 (jnxFanFailure) | SRX HE & Branch
The status of the fans has changed
CLI:
show chassis fan | Y | Investigation is needed
ACTION:
Re-seat fan tray
Verify if trap is intermittent, RMA may be needed |

| CHASSIS CLUSTER FAILOVER | 1.3.6.1.4.1.2636.3.39.1.14.1 (jnXJsChassisClusterMIB) | SRX HE & Branch
Indicates chassis cluster RG group has failed over
CLI:
show chassis cluster status | Y | ACTION:
Investigation of JSRPD and Messages log files |

**SYSTEM LOGGING**

Monitoring system log events augments the polling and trapping values obtained from the available OIDs supported in the system. Recommendation for system level logging is to maintain system log messages to Any Facility and Severity at a minimum of Critical. If possible we recommend external syslog server with Any Facility and Any Severity setting.

root@SRX# show system syslog
file messages {
    any critical:
        authorization info:
}

host 192.168.1.10 {
    any any:
}

NOTES:

1) When opening up Juniper SRX technical cases it is recommended to collect the following information from the SRX.
   a. Request Support Information
      request support information | save /var/tmp/rsi.txt
   b. System Logs
      >start shell
      % su (enter in root password)
      % tar -cvzf /root/log.tgz /var/log/*
      %exit
      A log.tgz file will be created in the /cf/root/ folder that you can upload to the support case.

2) Some MIBs require Lsys Name when being polled in Junos 11.2 and higher versions and will not show output on CLI outputs while using >show snmp mib walk Refer to KB23155 (Recommendation is to use default@<communityname> for community entry on MIB Manager unless polling for specific Lsys outputs.)