



OpenNMS 101

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<http://www.opennms.org/Training>

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Module 8: Service Assurance



Monitoring a Service

- Now that SNMP is configured, create a new service
- Use “extend” to create a “Class-Monitor” service.
- Test the service from the command line
- Add the service to the localhost node
- Update the poller configuration
- Test the service



net-snmp extend

- The “extend” directive can be used to expose the output of a command via SNMP.
- Create a script called `/tmp/classmonitor.sh`

```
#!/bin/bash  
echo ok
```

- `chmod +x /tmp/classmonitor.sh`
- `/tmp/classmonitor.sh`
 `ok`



Update `/etc/snmp/snmpd.conf`

- Edit `/etc/snmp/snmpd.conf`
- Add at the bottom

```
extend classmonitor /tmp/classmonitor.sh
```

- Restart `snmpd`

```
systemctl restart snmpd
```

snmpwalk Output

```
# snmpwalk -v2c -c YrUsonoZ localhost .1.3.6.1.4.1.8072.1.3.2
NET-SNMP-EXTEND-MIB::nsExtendNumEntries.0 = INTEGER: 1
NET-SNMP-EXTEND-MIB::nsExtendCommand."classmonitor" = STRING: /tmp/class-monitor.sh
NET-SNMP-EXTEND-MIB::nsExtendArgs."classmonitor" = STRING:
NET-SNMP-EXTEND-MIB::nsExtendInput."classmonitor" = STRING:
NET-SNMP-EXTEND-MIB::nsExtendCacheTime."classmonitor" = INTEGER: 5
NET-SNMP-EXTEND-MIB::nsExtendExecType."classmonitor" = INTEGER: exec(1)
NET-SNMP-EXTEND-MIB::nsExtendRunType."classmonitor" = INTEGER: run-on-read(1)
NET-SNMP-EXTEND-MIB::nsExtendStorage."classmonitor" = INTEGER: permanent(4)
NET-SNMP-EXTEND-MIB::nsExtendStatus."classmonitor" = INTEGER: active(1)
NET-SNMP-EXTEND-MIB::nsExtendOutput1Line."classmonitor" = STRING: ok
NET-SNMP-EXTEND-MIB::nsExtendOutputFull."classmonitor" = STRING: ok
NET-SNMP-EXTEND-MIB::nsExtendOutNumLines."classmonitor" = INTEGER: 1
NET-SNMP-EXTEND-MIB::nsExtendResult."classmonitor" = INTEGER: 0
NET-SNMP-EXTEND-MIB::nsExtendOutLine."classmonitor".1 = STRING: ok
```

snmpwalk -On Output

```
# snmpwalk -v2c -c YrUsonoZ -On localhost .1.3.6.1.4.1.8072.1.3.2
.1.3.6.1.4.1.8072.1.3.2.1.0 = INTEGER: 1
.1.3.6.1.4.1.8072.1.3.2.2.1.2.12.99.108.97.115.115.109.111.110.105.116.111.114 = STRING: /tmp/class-
monitor.sh
.1.3.6.1.4.1.8072.1.3.2.2.1.3.12.99.108.97.115.115.109.111.110.105.116.111.114 = STRING:
.1.3.6.1.4.1.8072.1.3.2.2.1.4.12.99.108.97.115.115.109.111.110.105.116.111.114 = STRING:
.1.3.6.1.4.1.8072.1.3.2.2.1.5.12.99.108.97.115.115.109.111.110.105.116.111.114 = INTEGER: 5
.1.3.6.1.4.1.8072.1.3.2.2.1.6.12.99.108.97.115.115.109.111.110.105.116.111.114 = INTEGER: exec(1)
.1.3.6.1.4.1.8072.1.3.2.2.1.7.12.99.108.97.115.115.109.111.110.105.116.111.114 = INTEGER: run-on-read(1)
.1.3.6.1.4.1.8072.1.3.2.2.1.20.12.99.108.97.115.115.109.111.110.105.116.111.114 = INTEGER: permanent(4)
.1.3.6.1.4.1.8072.1.3.2.2.1.21.12.99.108.97.115.115.109.111.110.105.116.111.114 = INTEGER: active(1)
.1.3.6.1.4.1.8072.1.3.2.3.1.1.12.99.108.97.115.115.109.111.110.105.116.111.114 = STRING: ok
.1.3.6.1.4.1.8072.1.3.2.3.1.2.12.99.108.97.115.115.109.111.110.105.116.111.114 = STRING: ok
.1.3.6.1.4.1.8072.1.3.2.3.1.3.12.99.108.97.115.115.109.111.110.105.116.111.114 = INTEGER: 1
.1.3.6.1.4.1.8072.1.3.2.3.1.4.12.99.108.97.115.115.109.111.110.105.116.111.114 = INTEGER: 0
.1.3.6.1.4.1.8072.1.3.2.4.1.2.12.99.108.97.115.115.109.111.110.105.116.111.114.1 = STRING: ok
```

99.108.97.115.115.109.111.110.105.116.111.114 = classmonitor



Exercise #8: Service Monitoring

- Create the SNMP-based Class-Monitor service detector
- Add it to the localhost node
- Note monitoring status
- Insure that a polling package exists and that monitoring is occurring
- Cause an outage
- Restore the outage

Edit Default Foreign Source

Navigate to Configure → Manage Provisioning Requisitions → Edit Default FS

Detector

Name

Class

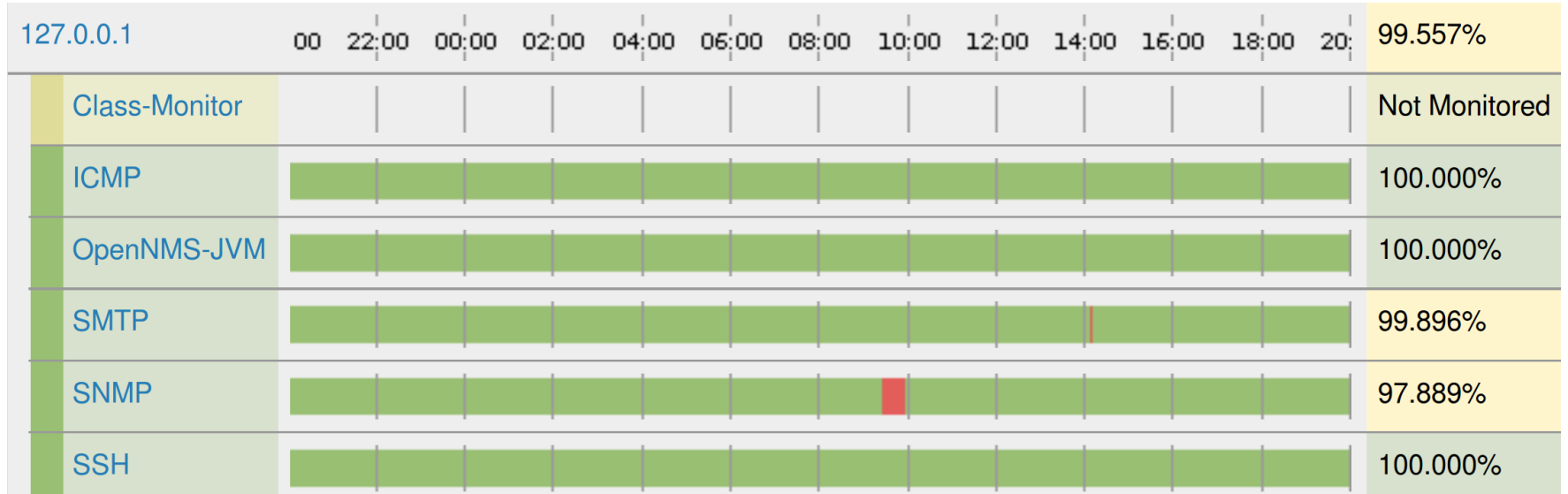
oid

Add Class-Monitor Service

- Add the new SNMP Detector with oid match
- Save the detector
- Save changes to the Default FS
- Rescan localhost

Recent Events				
232	12/6/16 19:58:07		Normal	The Node with Id: 1; ForeignSource: Class; ForeignId:1480972555732 has completed.
231	12/6/16 19:58:07		Warning	SNMP information on 127.0.0.1 is being refreshed for data collection purposes.
230	12/6/16 19:58:00		Warning	The Class-Monitor service has been discovered on interface 127.0.0.1.
229	12/6/16 19:57:59		Warning	A services scan has been forced on this node.
228	12/6/16 19:56:27		Normal	The Node with Id: 1; ForeignSource: Class; ForeignId:1480972555732 has completed.

Not Monitored



Update poller-configuration.xml

- `cd /opt/opennms/etc`
- **Run**

```
wget -N http://www.opennms.org/Training/Config/Exercise%208/poller-configuration.xml
```

- **Restart OpenNMS**
`systemctl restart opennms`
- **Edit the `classmonitor.sh` file and change "ok" to something else.**

Create a Poller Package

```
<package name="Package for Class">
  <filter>IPADDR != '0.0.0.0'</filter>
  <include-range begin="1.1.1.1" end="254.254.254.254" />
  <include-range begin="::1" end="ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff" />
  <rrd step="30">
    <rra>RRA:AVERAGE:0.5:1:20160</rra>
    <rra>RRA:AVERAGE:0.5:120:1488</rra>
    <rra>RRA:AVERAGE:0.5:2880:366</rra>
    <rra>RRA:MAX:0.5:2880:366</rra>
    <rra>RRA:MIN:0.5:2880:366</rra>
  </rrd>
  <service name="Class-Monitor" interval="30000" user-defined="true" status="on">
    <parameter key="oid"
      value=".1.3.6.1.4.1.8072.1.3.2.4.1.2.12.99.108.97.115.115.109.111.110.105.116.111.114.1" />
    <parameter key="operator" value="" />
    <parameter key="operand" value="ok" />
  </service>
  <downtime interval="30000" begin="0" end="300000" /><!-- 30s, 0, 5m -->
  <downtime interval="300000" begin="300000" end="43200000" /><!-- 5m, 5m, 12h -->
  <downtime interval="600000" begin="43200000" end="432000000" /><!-- 10m, 12h, 5d -->
  <downtime begin="432000000" delete="true" /><!-- anything after 5 days delete -->
</package>
<monitor service="Class-Monitor" class-name="org.opennms.netmgt.poller.monitors.SnmpMonitor" />
```

Downtime Model

The OpenNMS downtime model is unique:

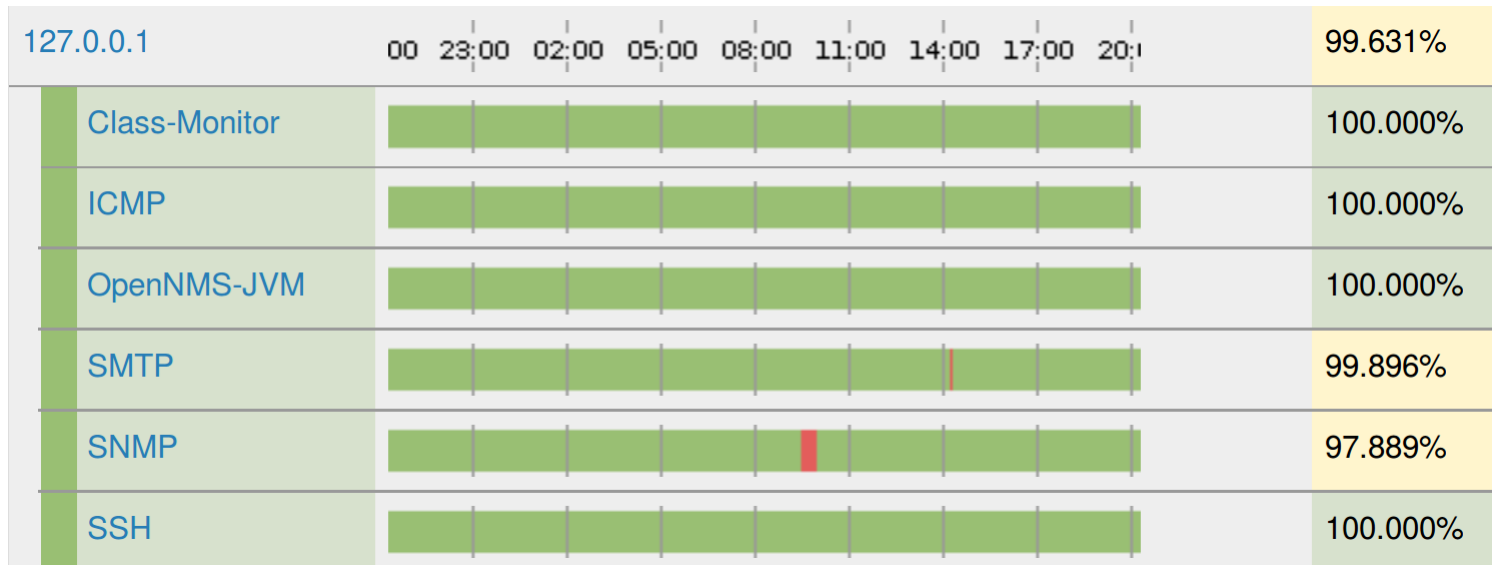
```
<downtime interval="30000" begin="0" end="300000" />  
    <!-- 30s, 0, 5m -->  
<downtime interval="300000" begin="300000" end="43200000" />  
    <!-- 5m, 5m, 12h -->  
<downtime interval="600000" begin="43200000" end="432000000" />  
    <!-- 10m, 12h, 5d -->  
<downtime begin="432000000" delete="true" />  
    <!-- anything after 5 days delete -->
```

Remember to remove the “end” when removing delete

Reload the Pollerd Configuration

```
# systemctl restart opennms
```

```
[# send-event.pl uei.opennms.org/internal/reloadDaemonConfig -p 'daemonName Pollerd']
```



Test the New Monitor

Edit `/tmp/classmonitor.sh` and change "ok"

Recent Events

255 12/6/16 20:35:51 Minor Class-Monitor outage identified on interface 127.0.0.1 with reason code: Observed value 'notok' does not meet criteria '= ok'.

Results 1-1 of 1

▼ ID	▼ ID	▼ ID	▼ ID	▼ ID	▼ ID
Ack	Severity	Node	Count	Last Event Time	Log Msg
<input type="checkbox"/>	32	localhost ⊕ ⊖	1	Dec 6, 2016 8:35:51 PM 📄 📄	Class-Monitor outage identified on interface 127.0.0.1 with reason code: Observed value 'notok' does not meet criteria '= ok'.

▼ ID	Event ID	Severity	Sent Time	Responder	Respond Time	Node	Interface	Service
<input type="checkbox"/> 13	255	Minor	Dec 6, 2016 8:35:51 PM			localhost ⊕ ⊖	127.0.0.1 ⊕	Class-Monitor ⊕
The Class-Monitor service poll on interface localhost (127.0.0.1) on node localhost failed at Tuesday, December 6, 2016 8:35:51 PM EST.								

Scheduled Outages

- Scheduled Outages are “poll” outages: OpenNMS stops polling
- Can be made daily, weekly, day of the month or for a specific date range.

					Affects...				
Name	Type	Nodes/Interfaces	Times	Notifications	Polling	Thresholds	Data collection		
thereckoning.opennms.org	specific	Node: thereckoning.opennms.org	22-Nov-2016 00:00:00 - 31-Dec-2016 23:59:59	✓	✓	✓	✓	Edit	Delete
Vitality No Notifications	specific	Node: outbound.vitality.net	06-Dec-2016 00:00:00 - 31-Dec-2017 23:59:59	✓	✗	✗	✗	Edit	Delete

Node: **outbound.vitality.net**  70  Vitality  1361221938266

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This node is currently affected by the following scheduled outages: [Vitality No Notifications](#)