OpenNMS 101

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Module 3: Events

Events Are At the Heart of OpenNMS

- OpenNMS is event driven
- The key process is called "eventd"
- Listens on port 5817 for XML
- Daemon config: `eventd-configuration.xml`
- Events config: `eventconf.xml`
- Events identified by a "uei": unique event identifier
- Use `send-event.pl` to send events

eventd-configuration.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<EventdConfiguration
    xmlns="http://xmlns.opennms.org/xsd/config/eventd"
    TCPAddress="127.0.0.1" TCPPort="5817"
    UDPAddress="127.0.0.1" UDPPort="5817"
    receivers="5"
    getNextEventID="SELECT nextval('eventsNxtId')"
    socketSoTimeoutRequired="yes"
    socketSoTimeoutPeriod="3000"/>
```

eventconf.xml

Event configuration is driven by this file, which has two main purposes:

- Global security settings

- Include files that list event definitions

Event Include Files

```
</events>
    <event-file>events/opennms.events.xml</event-file>
    <event-file>events/Translator.default.events.xml</event-file>
    <event-file>events/Rancid.events.xml</event-file>
    <event-file>events/3Com.events.xml</event-file>
    <event-file>events/AdaptecRaid.events.xml</event-file>
    <event-file>events/ADIC-v2.events.xml</event-file>
                            .   .   .
    <event-file>events/VMWare.vc.events.xml</event-file>
    <event-file>events/VMWare.vminfo.events.xml</event-file>
    <event-file>events/VMWare.obsolete.events.xml</event-file>
    <event-file>events/VMWare.events.xml</event-file>
    <event-file>events/Waverider.3000.events.xml</event-file>
    <event-file>events/Websense.events.xml</event-file>
    <event-file>events/Xerox-V2.events.xml</event-file>
    <event-file>events/Xerox.events.xml</event-file>
    <event-file>events/topology-status.events.xml</event-file>
    <event-file>events/ncs-component.events.xml</event-file>
    <event-file>events/asset-management.events.xml</event-file>
    <event-file>events/Standard.events.xml</event-file>
    <event-file>events/default.events.xml</event-file>
</events>
```

An Internal OpenNMS Event

```
<event>

    <uei>uei.opennms.org/internal/discovery/newSuspect</uei>
    <event-label>OpenNMS-defined internal event:
                 discovery newSuspect</event-label>

    <descr><p>Interface %interface% has been discovered and
is being queued for a services scan.</p>
    </descr>

    <logmsg dest="logndisplay">A new interface (%interface%)
            has been discovered and is being queued for a
            services scan.</logmsg>

    <severity>Warning</severity>
</event>
```

Event Substitutions

(https://wiki.opennms.org/wiki/Event_substitutions)

- uei
- source
- nodeid
- time
- shorttime (shorter format time stamp)
- host
- interface
- snmphost

- service
- snmp
- id
- idtext
- version
- specific
- generic
- community
- severity
- operinstruct
- mouseovertext

- parm[values-all]
- parm[names-all]
- parm[name-#] from release 1.6.3
- parm[all]
- parm[]
- parm[##]
- parm[#]

Log Message Destination

- `logndisplay` – both display the event in the user interface and log in the database.

- `logonly` – just log the event in the database.

- `donotpersist` – process the event but do not display or log it.

- `discardtraps` – just for SNMP traps, don't even process them.

Event Severities

Critical	This event means numerous devices on the network are affected by the event. Everyone who can should stop what they are doing and focus on fixing the problem.	
Major	A device is completely down or in danger of going down. Attention needs to be paid to this problem immediately.	
Minor	A part of a device (a service, and interface, a power supply, etc.) has stopped functioning. The device needs attention.	
Warning	An event has occurred that may require action. This severity can also be used to indicate a condition that should be noted (logged) but does not require direct action.	
Indeterminate	No Severity could be associated with this event.	
Normal	Informational message. No action required.	
Cleared	This event indicates that a prior error condition has been corrected and service is restored	

Sending Events

- `$ /opt/opennms/bin/send-event.pl uei.foo`

▼ ID Severity	Time	Node	Interface	Service
17　**Indeterminate** ⊞ ⊟	Dec 4, 2016 2:24:13 AM ◀ ▶			
	uei.foo ⊞ ⊟ Edit notifications for event			
	An event with no matching configuration was received from interface .			

- `$ /opt/opennms/bin/send-event.pl -x 7 uei.foo`

▼ ID Severity	Time	Node	Interface	Service
18　**Critical** ⊞ ⊟	Dec 4, 2016 2:30:31 AM ◀ ▶			
	uei.foo ⊞ ⊟ Edit notifications for event			
	An event with no matching configuration was received from interface .			

Restart `eventd` For Changes

There several ways to let eventd know that ther configuration files have:

- Restart OpenNMS
- Send a specific event:

  `send-event.pl uei.opennms.org/internal/eventsConfigChange`

- Send a generic event:

  `send-event.pl uei.opennms.org/internal/reloadDaemonConfig -p 'daemonName Eventd'`

/opt/opennms/bin/opennms -v status

```
OpenNMS.Eventd          : running
OpenNMS.Trapd           : running
OpenNMS.Queued          : running
OpenNMS.Actiond         : running
OpenNMS.Notifd          : running
OpenNMS.Scriptd         : running
OpenNMS.Rtcd            : running
OpenNMS.Pollerd         : running
OpenNMS.PollerBackEnd   : running
OpenNMS.EnhancedLinkd   : running
OpenNMS.Ticketer        : running
OpenNMS.Collectd        : running
OpenNMS.Discovery       : running
OpenNMS.Vacuumd         : running
OpenNMS.EventTranslator: running
OpenNMS.PassiveStatusd : running
OpenNMS.Statsd          : running
OpenNMS.Provisiond      : running
OpenNMS.Reportd         : running
OpenNMS.Alarmd          : running
OpenNMS.Ackd            : running
OpenNMS.JettyServer     : running
opennms is running
```

Exercise #3: Create an Event

- Send a `uei.opennms.org/class/happiness` event
- Note how it appears in the GUI
- Create a `Class.events.xml` file
- Add it to `eventconf.xml`
- Reload the event configuration
- Send the event again
- Note how it appears in the GUI

Send a "happiness" Event

```
$ send-event.pl uei.opennms.org/class/happiness
```

▼ ID Severity	Time	Node	Interface	Service
19 **Indeterminate** ⊞ ⊟	Dec 4, 2016 3:11:21 AM ◀ ▶			
	uei.opennms.org/class/happiness ⊞ ⊟ Edit notifications for event			
	An event with no matching configuration was received from interface .			

Get the `Class.events.xml` **File**

All event files should live in /opt/opennms/etc/events

- First, `cd /opt/opennms/etc/events`
- Then:
  `wget -N https://www.opennms.org/Training/Class/Config/Exercise%203/Class.events.xml`
- Edit `/opt/opennms/etc/eventconf.xml`

```
  </global>
<event-file>events/Class.events.xml</event-file>
<event-file>events/opennms.events.xml</event-file>
<event-file>events/Translator.default.events.xml</event-file>
```

Class.events.xml

```xml
<events>
  <event>
    <uei>uei.opennms.org/class/happiness</uei>
    <event-label>OpenNMS defined event: The OpenNMS Class is so happy</event-label>
    <descr>
      &lt;p&gt;This event is sent when the OpenNMS Class is happy.&lt;/p&gt;
      &lt;ul&gt;
      &lt;li&gt;Dance, Everybody Dance!&lt;/li&gt;
      &lt;li&gt;Life is Good!&lt;/li&gt;
      &lt;li&gt;This is Fun!&lt;/li&gt;
      &lt;/ul&gt;
    </descr>
    <logmsg dest='logndisplay'>
      &lt;p&gt;OpenNMS Class is Happy! &lt;/p&gt;
    </logmsg>
    <severity>Normal</severity>
  </event>
</events>
```

Reload eventd and Send Event

```
$ send-event.pl
  uei.opennms.org/internal/reloadDaemonConfig -p 'daemonName Eventd'

$ send-event.pl uei.opennms.org/class/happiness
```

▼ ID Severity	Time	Node	Interface	Service
25	Normal ⊞⊟	Dec 4, 2016 3:34:48 AM ◀ ▶		
		uei.opennms.org/class/happiness ⊞⊟ Edit notifications for event		
		OpenNMS Class is Happy!		
24	Normal ⊞⊟	Dec 4, 2016 3:34:46 AM ◀ ▶		
		uei.opennms.org/internal/reloadDaemonConfigSuccessful ⊞⊟ Edit notifications for event		
		The daemon: Eventd configuration changes have successfully been applied.		
23	Normal ⊞⊟	Dec 4, 2016 3:34:46 AM ◀ ▶		
		uei.opennms.org/internal/reloadDaemonConfig ⊞⊟ Edit notifications for event		
		The daemon: Eventd configuration files has changed.		