NETCONF Monitoring Schema
draft-chisholm-netconf-monitoring-00.txt

Status of this Memo

By submitting this Internet-Draft, each author represents that any applicable patent or other IPR claims of which he or she is aware have been or will be disclosed, and any of which he or she becomes aware will be disclosed, in accordance with Section 6 of BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.txt.

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html.

This Internet-Draft will expire on August 29, 2007.

Copyright Notice

Copyright (C) The IETF Trust (2007).
Abstract

This document defines Netconf content via XML Schema to be used to monitor the Netconf protocol. It provides information about Netconf sessions and subscriptions.

Table of Contents

1. Introduction ......................................................... 3
   1.1. Definition of Terms ............................................ 3
       1.2. XML Schema to Monitor Netconf .................. 4
2. Security Considerations ............................................ 9
3. Acknowledgements .................................................. 10
4. Normative References .............................................. 11
Authors’ Addresses .................................................... 12
Intellectual Property and Copyright Statements .................... 13
1. Introduction

[NETCONF] can be conceptually partitioned into four layers:

<table>
<thead>
<tr>
<th>Layer</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Configuration data</td>
</tr>
<tr>
<td>Operations</td>
<td>&lt;get-config&gt;, &lt;edit-config&gt; &lt;notification&gt;</td>
</tr>
<tr>
<td>RPC</td>
<td>&lt;rpc&gt;, &lt;rpc-reply&gt;</td>
</tr>
<tr>
<td>Transport</td>
<td>BEEP, SSH, SSL, console</td>
</tr>
</tbody>
</table>

This document defines Netconf content via [XML Schema] to be used to monitor the Netconf protocol. It provides information about Netconf sessions and subscriptions.

Figure 1

1.1. Definition of Terms

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].


Managed Object: A collection of one or more Elements that define an abstract thing of interest.

Subscription: A concept related to the delivery of notifications (if any to send) involving destination and selection of notifications. It is bound to the lifetime of a session.

Operation: This term is used to refer to NETCONF protocol operations. Specifically within this document, operation refers to NETCONF protocol operations defined in support of NETCONF notifications.
1.2. XML Schema to Monitor Netconf

```xml
<xs:schema

 xmlns:xs="http://www.w3.org/2001/XMLSchema"
 xmlns="urn:ietf:params:xml:ns:netconf:state:1.0"
 xmlns:netconf="urn:ietf:params:xml:ns:netconf:base:1.0"
 targetNamespace="urn:ietf:params:xml:ns:netconf:state:1.0"
 elementFormDefault="qualified"
 attributeFormDefault="unqualified">
  <xs:annotation>
  <xs:documentation xml:lang="en">
    All elements in this Schema are read-only.
  </xs:documentation>
  </xs:annotation>

  <xs:import namespace="urn:ietf:params:xml:ns:netconf:base:1.0"
              schemaLocation="urn:ietf:params:xml:ns:netconf:base:1.0"/>

  <xs:import
      namespace="urn:ietf:params:xml:ns:netconf:notification:1.0"
      schemaLocation="urn:ietf:params:xml:ns:netconf:notification:1.0"/>

  <xs:element name="netconfState">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="capabilities">
          <xs:annotation>
            <xs:documentation xml:lang="en">
              List of NETCONF capabilities supported by this device.
            </xs:documentation>
          </xs:annotation>
          <xs:complexType>
            <xs:sequence>
              <xs:element name="capability" type="xs:anyURI" minOccurs="0" maxOccurs="unbounded"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="sessions">
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>

</xs:schema>
```
List of NETCONF sessions currently active on this device.

List of NETCONF configuration datastores (e.g. running, startup, candidate) supported on this device and related information.

List of NETCONF notification subscriptions active on this device and related information.
<!-- Complex Types -->

<x:scomplexType name="NetconfSessionInfo">
    <xs:sequence>
        <xs:element name="sessionId" type="netconf:SessionId"/>
        <xs:element name="username" type="xs:string"/>
        <xs:element name="loginTime" type="xs:dateTime"/>
    </xs:sequence>
</xs:scomplexType>

<x:scomplexType name="ConfigurationDatastoreInfo">
    <xs:sequence>
        <xs:element name="name" type="netconf:configNameType"/>
        <xs:element name="lockStatus" type="LockStatus"/>
    </xs:sequence>
</xs:scomplexType>

<x:scomplexType name="LockStatus">
    <xs:annotation>
        <xs:documentation>
            An indication of whether a resource is locked or unlocked.
            If locked, additional information about the locking such as
            user and time stamp is provided.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="lock-state" type="xs:string">
            <xs:restriction base="xs:string">
                <xs:enumeration value="locked"/>
                <xs:enumeration value="unlocked"/>
            </xs:restriction>
        </xs:element>
        <xs:element name="lockedBySession" type="netconf:SessionId" minOccurs="0">
            <xs:annotation>
                <xs:documentation>
                    The session ID of the session that has locked this resource.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:scomplexType>
</xs:element>
<xs:element name="lockedTime"
    type="xs:dateTime" minOccurs="0">
    <xs:annotation>
        <xs:documentation>
            The date and time of when the resource was locked.
            If the resource is currently unlocked, this element
            will not be present.
        </xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>

<xs:complexType name="NetconfSubscriptionInfo">
    <xs:annotation>
        <xs:documentation>
            Information about Netconf Notification Subscriptions.
        </xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="session-id"
            type="netconf:SessionId">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The session id associated with this subscription.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="stream"
            type="xs:string" minOccurs="0">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The stream associated with this subscription.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="filter"
            type="netconf:filterInlineType" minOccurs="0">
            <xs:annotation>
                <xs:documentation xml:lang="en">
                    The filters associated with this subscription.
                </xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
The named profile associated with this subscription. Note that the contents of the named profile may have changed since it was last applied.

The last time this subscription was modified. If it has not been modified since creation, this is the time of subscription creation.

A count of event notifications sent along this connection since the subscription was created.
2. Security Considerations

The information in this Schema provides information about Netconf system that could be used to aid an attack on that system. Care should be taken to restrict access to this information as appropriate.
3. Acknowledgements

Thanks to the Netconf working group for providing a much earlier draft of Schema to manage Netconf and Netconf Notifications that were cannibalized to produce this draft.
4. Normative References


Authors’ Addresses

Sharon Chisholm
Nortel
3500 Carling Ave
Nepean, Ontario  K2H 8E9
Canada

Email: schishol@nortel.com

Hector Trevino
Cisco
Suite 400
9155 E. Nichols Ave
Englewood, CO  80112
USA

Email: htrevino@cisco.com