Chapter 7

Summary of NETCONF Tag Elements

This chapter lists the tag elements that client applications and the NETCONF server use to control the NETCONF session and to exchange configuration information. It also describes the]]>]]> character sequence, which signals the end of each request and response. The entries are in alphabetical order. For information about the notational conventions used in this chapter, see Table 2 on page x.

]]>]]>

Usage

```
<hello>
     <!-- child tag elements included by client application or NETCONF server -->
</hello>
]]>]]>

<rpc [attributes]>
     <!-- tag elements in a request from a client application -->
</rpc>
]]>]]>

<rpc-reply xmlns="URN" xmlns:sdx="URL">
     <!-- tag elements in the response from the NETCONF server -->
</rpc-reply>
]]>]]>
```

Description

Signal the end of each XML document sent by the NETCONF server and client applications. Clients send the sequence after each XML document (after the closing </hello> tag and each closing </rpc> tag). The NETCONF server sends the sequence after its closing </hello> tag and each closing </rpc-reply> tag.

Use of this signal is required by RFC 4742, *Using the NETCONF Configuration Protocol over Secure Shell (SSH)*, available at http://www.ietf.org/rfc/rfc4742.txt.

Usage Guidelines

See "Generating Well-Formed XML Documents" on page 20.

See Also

<hello> on page 87, <rpc> on page 88, <rpc-reply> on page 89

<close-session/>

Usage

```
<rpc>
    <close-session/>
</rpc>
]]>]]>
```

Description Request that the NETCONF server end the current session.

Usage Guidelines See "Ending a NETCONF Session and Closing the Connection" on page 37.

See Also]]>]]> on page 81, <rpc> on page 88

<commit>

Usage

```
<rpc>
    <commit/>
</rpc>
]]>]]>
```

Description Request that the NETCONF server commit the configuration immediately, making it the active configuration.

Usage Guidelines See "Committing a Configuration" on page 80.

See Also]]>]]> on page 81, <rpc> on page 88

<copy-config>

Usage

```
<rpc>
    <copy-config>
      <target>
        <candidate/>
      </target>
      <source>
        <url>
          <!-- location specifier for file containing the new configuration -->
        </url>
      </source>
    <copy-config>
</rpc>
]]>]]>
```

Description Replace the existing candidate configuration with configuration data contained in a file.

Contents <source>—Encloses the <url> tag element, which specifies the source of the configuration data.

<url>—Names the file that contains the new configuration data to substitute for the existing candidate configuration. For information about specifying the file location, see "Providing Configuration Data in a File" on page 61.

The <target> tag element and its contents are explained separately.

Usage Guidelines See "Replacing the Configuration with the Contents of a File" on page 66.

See Also]]>]]> on page 81, <rpc> on page 88, <target> on page 90

<data>

Usage

```
<rpc-reply xmlns="URN" xmlns:sdx="URL">
    <data>
      <configuration>
        <!-- XML tag elements for the configuration data -->
      </configuration>
    </data>
</rpc-reply>
]]>]]>
```

Description Enclose configuration data returned by the NETCONF server in response to a <get-config> tag element.

Contents <configuration>—Encloses configuration tag elements. It is the top-level tag element in the XML API, equivalent to the [edit] hierarchy level in the CLI. For information about configuration elements, see the *SRC XML API Configuration Reference*.

Usage Guidelines See "Requesting Configuration Information" on page 44.

See Also]]>]]> on page 81, <get-config> on page 86, <rpc-reply> on page 89

<delete-config>

Usage

```
<rpc>
    <delete-config>
      <target>
        <candidate/>
      </target>
    <delete-config>
</rpc>
]]>]]>
```

Description Delete the existing candidate configuration.

Contents The <target> tag element and its contents are explained separately.

Usage Guidelines See "Replacing the Entire Candidate Configuration" on page 66.

See Also]]>]]> on page 81, <rpc> on page 88, <target> on page 90

<discard-changes/>

Usage

```
<rpc>
    <discard-changes/>
</rpc>
]]>]]>
```

Description Discard changes made to the candidate configuration, and make its contents match the contents of the current running (active) configuration. This operation is equivalent to the CLI configuration mode rollback command.

Usage Guidelines See "Replacing the Candidate Configuration with the Running Configuration" on page 67.

See Also]]>]]> on page 81, <rpc> on page 88

<edit-config>

Usage

```
<rpc>
    <edit-config>
      <target>
        <candidate/>
      </target>

    <!-- EITHER -->
      <config>
        <configuration>
          <!-- tag elements representing the data to incorporate -->
        </configuration>
      </config>

    <!-- OR -->
      <url>
        <!-- location specifier for file containing data -->
      </url>

      <default-operation>(merge | none | replace)</default-operation>
    <edit-config>
</rpc>
]]>]]>
```

Description Request that the NETCONF server incorporate configuration data into the candidate configuration. Provide the data in one of two ways:

- Include the <url> tag element to specify the location of a file that contains the XML configuration tag elements to incorporate.
- Include the <config> tag element to provide a data stream of XML configuration tag elements to incorporate. The tag elements are enclosed in the <configuration> tag element.

Contents <config>—Encloses the <configuration> tag element.

<configuration>—Encloses the tag elements to incorporate into the candidate configuration, provided as a data stream. For information about the syntax for representing the elements to create, delete, or modify, see “Mapping Configuration Statements to SRC XML Tag Elements” on page 13 and “Changing Individual Configuration Elements” on page 68.

<default-operation>—(Optional) Specifies how to incorporate the new configuration data into the candidate configuration, particularly when there are conflicting statements. The following are acceptable values:

- merge—Combines the new configuration data with the candidate configuration according to the rules defined in “Setting the Default Mode for Incorporating New Configuration Data” on page 64. This is the default mode if the <default-operation> tag element is omitted. It applies to all elements in the new data that do not have the operation attribute in their opening container tag to specify a different mode. (For information about the operation attribute, see “Changing Individual Configuration Elements” on page 68.)

- none—Retains each configuration element in the existing candidate configuration unless the new data includes a corresponding element that has the operation attribute in its opening container tag to specify an incorporation mode. This mode prevents the NETCONF server from creating parent hierarchy levels for an element that is being deleted. For more information, see “Deleting Configuration Elements” on page 72.

- replace—Discards the existing candidate configuration and replaces it with the new data. For more information, see “Setting Replace Mode as the Default Mode” on page 67.

<url>—Specifies the full pathname of the file that contains the configuration data to load. The file must reside on the local disk. For more information, see “Providing Configuration Data in a File” on page 61.

The <target> tag element and its contents are explained separately.

Usage Guidelines See “Changing Configuration Information” on page 59.

See Also]]>]]> on page 81, <rpc> on page 88, <target> on page 90

<error-info>

Usage

```
<rpc-reply xmlns="URN" xmlns:sdx="URL">
    <rpc-error>
      <error-info>
        <bad-element>command-or-statement</bad-element>
      </error-info>
    </rpc-error>
</rpc-reply>
]]>]]>
```

Description Provide additional information about the event or condition that causes the NETCONF server to report an error or warning in the <rpc-error> tag element.

Contents <bad-element>—Identifies the command or configuration statement that was being processed when the error or warning occurred. For a configuration statement, the <error-path> tag element enclosed in the <rpc-error> tag element specifies the statement's parent hierarchy level.

Usage Guidelines See "Handling an Error or Warning" on page 35.

See Also]]>]]> on page 81, <rpc-error> on page 89, <rpc-reply> on page 89

<get-config>

Usage

```
<rpc>
    <get-config>
      <source>
        <candidate/>
      </source>
    </get-config>

    <get-config>
      <source>
        <candidate/>
      </source>
      <filter type="subtree">
        <configuration>
          <!-- tag elements for each configuration element to return -->
        </configuration>
      </filter>
    </get-config>
</rpc>
]]>]]>
```

Description Request configuration data from the NETCONF server. The child tag elements <source> and <filter> specify the source and scope of data to display:

- To display the entire candidate configuration, enclose the <source> tag element and <candidate/> tag in the <get-config> tag element.
- To display one or more sections of the configuration hierarchy (hierarchy levels or configuration objects), enclose the appropriate child tag elements in the <source> and <filter> tag elements.

Contents <candidate/>—Represents the candidate configuration.

<configuration>—Encloses tag elements that specify which configuration elements to return.

<filter>—Encloses the <configuration> tag element. The mandatory type attribute indicates the kind of syntax used to represent the requested configuration elements; the only acceptable value is subtree.

To specify the configuration elements to return, include within the <filter> tag element the XML tag elements that represent all levels of the configuration hierarchy from the root (represented by the <configuration> tag element) down to each element to display. For information about the syntax for representing each kind of element, see "Specifying the Scope of Configuration Information to Return" on page 46. For information about the configuration elements available in the current version of the SRC software, see the *SRC XML API Configuration Reference*.

<source>—Encloses the tag that specifies the source of the configuration data. To specify the candidate configuration, include the <candidate/> tag.

Usage Guidelines See "Requesting Configuration Information" on page 44.

See Also]]>]]> on page 81, <data> on page 83, <rpc> on page 88

<hello>

Usage

```
<!-- emitted by a client application -->
<hello>
    <capabilities>
      <capability>URI</capability>
    </capabilities>
</hello>
]]>]]>

<!-- emitted by the NETCONF server -->
<hello>
    <capabilities>
      <capability>URI</capability>
    </capabilities>
    <session-id>session-identifier</session-id>
</hello>
]]>]]>
```

Description Specify which operations, or *capabilities,* the emitter supports from among those defined in the NETCONF specification. The client application must emit the <hello> tag element before any other tag element during the NETCONF session, and must not emit it more than once.

Contents <capabilities>—Encloses one or more <capability> tags, which together specify the set of supported NETCONF operations.

<capability>—Specifies the uniform resource identifier (URI) of a capability defined in the NETCONF specification or by a vendor. Each capability from the NETCONF specification is represented by a uniform resource name (URN). Capabilities defined by vendors are represented by URNs or URLs. For a list of the capabilities supported by the NETCONF server for the SRC software, see "Exchanging <hello> Tag Elements" on page 26.

<session-id>—(Generated by NETCONF server only) Specifies the process ID (PID) of the NETCONF server for the session.

Usage Guidelines See “Exchanging <hello> Tag Elements” on page 26.

See Also]]>]]> on page 81

<kill-session>

Usage
```
<rpc>
    <kill-session>
      <session-id>PID</session-id>
    </kill-session>
</rpc>
]]>]]>
```

Description Request that the NETCONF server terminate another NETCONF session.

The client application must have maintenance permission.

Contents <session-id>—The PID of the entity conducting the session to terminate. The PID is reported in the <rpc-error> tag element that the NETCONF server generates.

Usage Guidelines See “Terminating Another NETCONF Session” on page 36.

See Also]]>]]> on page 81, <rpc> on page 88

<ok/>

Usage
```
<rpc-reply xmlns="URN" xmlns:sdx="URL">
    <ok/>
</rpc-reply>
]]>]]>
```

Description Indicate that the NETCONF server successfully performed a requested operation that changes the state or contents of the configuration.

Usage Guidelines See “Configuration Change Responses” on page 34.

See Also]]>]]> on page 81, <rpc-reply> on page 89

<rpc>

Usage
```
<rpc [attributes]>
    <!-- tag elements in a request from a client application -->
</rpc>
]]>]]>
```

Description Enclose all tag elements in a request generated by a client application.

Attributes (Optional) One or more attributes of the form *attribute-name*="*value*". This feature can be used to associate requests and responses if the value assigned to an attribute by the client application is unique in each opening <rpc> tag. The NETCONF server echoes the attribute unchanged in its opening <rpc-reply> tag, making it simple to map the response to the initiating request. The NETCONF specification assigns the name message-id to this attribute.

Usage Guidelines See "Sending a Request to the NETCONF Server" on page 29.

See Also]]>]]> on page 81, <rpc-reply> on page 89

<rpc-error>

Usage

```
<rpc-reply xmlns="URN" xmlns:sdx="URL">
    <rpc-error>
      <error-severity>error-severity</error-severity>
      <error-path>error-path</error-path>
      <error-message>error-message</error-message>
      <error-info>...</error-info>
    </rpc-error>
</rpc-reply>
]]>]]>
```

Description Indicate that the NETCONF server has experienced an error while processing the client application's request. If the server has already emitted the response tag element for the current request, the information enclosed in that response tag element might be incomplete. The client application must include code that discards or retains the information, as appropriate. The child tag elements described in the Contents section detail the nature of the error. The NETCONF server does not necessarily emit all child tag elements; it omits tag elements that are not relevant to the current request.

Contents <error-message>—Describes the error or warning in a natural-language text string.

<error-path>— Specifies the path to the configuration hierarchy level at which the error or warning occurred, in the form of the CLI configuration mode banner.

<error-severity>—Indicates the severity of the event that caused the NETCONF server to return the <rpc-error> tag element. The two possible values are error and warning.

The <error-info> tag element is described separately.

Usage Guidelines See "Handling an Error or Warning" on page 35.

See Also]]>]]> on page 81, <error-info> on page 85, <rpc-reply> on page 89

<rpc-reply>

Usage

```
<rpc-reply xmlns="URN" xmlns:sdx="URL">
    <!-- tag elements in a reply from the NETCONF server -->
</rpc-reply>
]]>]]>
```

Description Enclose all tag elements in a reply from the NETCONF server. The immediate child tag element is usually one of the following:

- The XML tag element that encloses the data requested by a client application with an XML operational request tag element; for example, the <interface-information> tag element in response to the <get-interface-information> tag element
- The <data> tag element, to enclose the data requested by a client application with the <get-config> tag element
- The <ok/> tag, to confirm that the NETCONF server successfully performed an operation that changes the state or contents of a configuration (such as a change or commit operation)
- The <output> tag element, if the XML API does not define a specific tag element for requested operational information
- The <rpc-error> tag element, if the requested operation generated an error or warning

Attributes xmlns—Names the default XML namespace for the enclosed tag elements.

Usage Guidelines See "Parsing the NETCONF Server Response" on page 32.

See Also]]>]]> on page 81, <data> on page 83, <ok/> on page 88, <rpc> on page 88, <rpc-error> on page 89

<target>

Usage

```
<rpc>
    <( copy-config | delete-config | edit-config )>
      <target>
        <candidate/>
      </target>
    </( copy-config | delete-config | edit-config )>
</rpc>
]]>]]>
```

Description Specify the configuration on which to perform an operation.

Contents <candidate/>—Specifies the candidate configuration as the configuration on which to perform the operation. This is the only acceptable value for the SRC software.

Usage Guidelines See "Changing the Candidate Configuration" on page 60 and "Replacing the Configuration with the Contents of a File" on page 66.

See Also]]>]]> on page 81, <copy-config> on page 82, <delete-config> on page 83, <edit-config> on page 84, <rpc> on page 88,