With **System** Capability for NETCONF

draft-ma-netconf-with-system-01

Feng Chong(\texttt{frank.fengchong@huawei.com})
Qiufang Ma(\texttt{maqiufang1@huawei.com})  Presenter
Motivation and Goal

• Motivation
  • Default data handling including Data Retrieval and Create/Delete Operation has been well specified in RFC6243;
  • Before NMDA (RFC8342) is introduced, System configuration data can be located anywhere in the device, there is no standard behavior for system data handling;
  • After NMDA is introduced, system configuration is defined by RFC8342 and has been moved to <operational>. When referencing system configured data item (e.g., A leafref B, or system configured data item in the when/must statement) in the <operational>, the duplicated system configured data item need to be retrieved (e.g., using origin-filter with value or:system) from <operational> and overridden by the client (i.e., copy the data from <operational> and put it into the <running>);
    • Weak reference (set “require-instance” as false and ignore the referenced data) has its limitation
    • When system configuration gets updated, there is no standard mechanism to synchronize the data into <running> and the client can not detect the update automatically.

• Goal:
  • Define system configuration data handling including Data Retrieval and Create/Delete Operation
A new datastore named ‘system’ is introduced. It doesn’t persist across reboots. At boot time, the device generates system configuration in <system>.

The <running> datastore is automatically synced up with <system> in “report-all” basic mode:
- e.g., the system configuration is automatically loaded into <running> when the device is powered on or the physical resource is present.
- e.g., when the system configuration is updated, it will be synced up into <running>

A server using “explicit” basic mode will not update <running> with <system> automatically.

In addition, two data handling behaviors is defined:
- data retrieval operation
- create/delete operation
Initialization during reboot

Create system configuration in <system>

Load <startup> into <running>

Create conditional system configuration in <system>

Basic-mode="report-all"

Y

Load <system> into <running>

END

Insert a physical resource

Insert a physical interface

Create corresponding system configuration in <system>

Basic-mode="report-all"

Y

Load <system> into <running>

END

Remove a physical resource

Remove a physical interface

remove corresponding system configuration from <system>

END

N (i.e., basic-mode="explicit")

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Data Retrieval Usage Example

- All the interface configuration data snippets including system configuration are shown in the left
- Below is XML responses to the <get> operation with different with-system parameters
- In this example, the server’s basic mode is “report-all”
Create and delete operations behavior definition

<table>
<thead>
<tr>
<th>Basic mode</th>
<th>create and delete operations towards &lt;running&gt;</th>
</tr>
</thead>
</table>
| report-all | **Precondition**: for a data node that is loaded from <system> automatically  
A valid ‘create’ operation attribute must fail with a ‘data-exists’ error-tag;  
A valid ‘delete’ operation attribute must succeed; |
| Explicit   | **Precondition**: for a system configuration data node that is not explicitly set by the client  
A valid ‘create’ operation attribute must succeed;  
A valid ‘delete’ operation attribute must fail.  
A valid ‘delete’ operation attribute for a data node explicitly set by the client must succeed; |

- **Report-all**  
  - Update <running> with <system> automatically
- **Explicit**  
  - Any <system> update will not be loaded into <running> automatically
Follow up

• One of the open issues in draft-netconf-trust-anchors:
  • For some built-in trust anchors, they must first be copied into <running> in order for being referenced.
  • Key values of with-system capability for NETCONF
    ➢ Helping avoid synchronizing into <running> manually (e.g., retrieve from <operational> firstly, and then copy into <running>) when referencing system configuration
    ➢ Proposing a standard system configuration data handling behavior

• Address comments raised in the meeting.
• Collect more suggestions and comments.
• Contributions/coauthors are welcome! 😊