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Factory default Setting
draft-wu-netmod-factory-default-02

Abstract

This document defines a method to reset a YANG datastore to its factory-default content. The reset operation may be used e.g. during initial zero-touch configuration or when the existing configuration has major errors, so re-starting the configuration process from scratch is the best option.

A new reset-datastore RPC is defined. Several methods of documenting the factory-default content are specified.

Optionally a new "factory-default-running" read-only datastore is defined, that contains the data that will be copied over to the running datastore at reset.

Status of This Memo

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1. Introduction

This document defines a method to reset a YANG datastore to its factory-default content. The reset operation may be used e.g. during initial zero-touch configuration or when the existing configuration has major errors, so re-starting the configuration process from scratch is the best option. When resetting a datastore all previous configuration settings will be lost and replaced by the factory-default content.

A new reset-datastore RPC is defined. Several methods of documenting the factory-default content are specified.

Optionally a new "factory-default-running" read-only datastore is defined, that contains the data that will be copied over to the running datastore at reset. This datastore can also be used in <get-data> or <copy-config> operations.

NETCONF defines the <delete> operation that allows resetting the <startup> datastore and the <discard-changes> operation that copies the content of the <running> datastore into the <candidate> datastore. However it is not possible to reset the running datastore, to reset the candidate datastore without changing the running datastore or to reset any dynamic datastore.

A RESTCONF server MAY implement the above NETCONF operations, but that would still not allow it to reset the running configuration.

1.1. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

The following terms are defined in [RFC8342] and are not redefined here:

- startup configuration datastore
- candiate configuration datastore
- running configuration datastore
- intended configuration datastore
- operational state datastore

The following terms are defined in this document as follows:

- factory-default datastore: A read-only datastore holding a preconfigured minimal initial configuration that can be used to initialize the configuration of a server. The content of the datastore is usually static, but MAY depend on external factors like available HW.

2. Reset-Datastore RPC

A new "reset-datastore" RPC is introduced. It will have a target datastore as a parameter. Upon receiveing the RPC the YANG server resets the content of the target datastore to its factory-default content. Only writable datastores can be specified as a target. Read-only datastores receive their content from other datastores (e.g. <intended> gets its content from <running>).

Factory-default content SHALL be specified by one of the following means in order of precedence

1. For the <running>, <candidate> and <startup> datastores as the content of the <factory-default> datastore, if it exists

2. YANG Instance Data [I-D.ietf-netmod-yang-instance-file-format]

3. In some implementation specific manner

4. For dynamic datastores unless otherwise specified the factory-default content is empty.

3. Factory-Default Datastore

This document introduces a new datastore resource named 'Factory-Default' that represents a preconfigured minimal initial configuration that can be used to initialize the configuration of a server.

- Name: "factory-default"

- YANG modules: all

- YANG nodes: all "config true" data nodes

- Management operations: The content of the datastore is set by the YANG server in an implementation dependent manner. The content can not be changed by management operations via NETCONF, RESTCONF, the CLI etc. unless specialized, dedicated operations are provided. The contents of the datastore can be read using NETCONF, RESTCONF <get-data> operation. The operations <reset-datastore> or <copy-config> can be used to copy the content of the datastore to another datastore. The content of the datastore is not propagated auomatically to any other datastores.

- Origin: This document does not define a new origin identity as it does not interact with <operational> datastore.

- o Protocols: RESTCONF, NETCONF and other management protocol.

- o Defining YANG module: "ietf-factory-default"

The datastore content is usually defined by the device vendor. It is usually static, but MAY change e.g. depending on external factors like HW available or during device upgrade.

On devices that support non-volatile storage, the contents of <factory > MUST persist across restarts

4. YANG Module

```
<CODE BEGINS> file "ietf-factory-default.yang"
module ietf-factory-default {
  yang-version 1.1;
  namespace urn:ietf:params:xml:ns:yang:ietf-factory-default;
  prefix fdef;

  import ietf-netconf { prefix nc ; }
  import ietf-datastores { prefix ds; }

  organization
    "IETF NETMOD (Network Modeling) Working Group";
  contact
    "WG Web:   <https://tools.ietf.org/wg/netconf/>
     WG List:  <mailto:netconf@ietf.org>

     WG Chair: Lou Berger
               <mailto:lberger@labn.net>
     WG Chair: Joel Jaeggli
               <mailto:joelja@bogus.com>
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               <mailto:kwatsen@juniper.net>

     Editor:   Balazs Lengyel
               <mailto:balazs.lengyel@ericsson.com>

     Editor:   Qin Wu
               <mailto:bill.wu@huawei.com>";

  description
    "This module defines the
    - reset-datastore RPC
    - factory-default datastore
    - an extension to the Netconf <copy-config> operation to
    allow it to operate on the factory-default datastore.
```

```
    It provides functionality to reset a YANG datastore to its
    factory-default content.

     Copyright (c) 2018 IETF Trust and the persons identified as
     authors of the code. All rights reserved.

     Redistribution and use in source and binary forms, with or
     without modification, is permitted pursuant to, and subject to
     the license terms contained in, the Simplified BSD License set
     forth in Section 4.c of the IETF Trust's Legal Provisions
     Relating to IETF Documents
     (https://trustee.ietf.org/license-info).

     The key words 'MUST', 'MUST NOT', 'REQUIRED', 'SHALL', 'SHALL
     NOT', 'SHOULD', 'SHOULD NOT', 'RECOMMENDED', 'MAY', and
     'OPTIONAL' in the module text are to be interpreted as described
     in RFC 2119 (https://tools.ietf.org/html/rfc2119).

     This version of this YANG module is part of RFC XXXX
     (https://tools.ietf.org/html/rfcXXXX); see the RFC itself for
     full legal notices.";

  revision 2018-10-09 {
    description
      "Initial revision.";
      reference "RFC XXXX: Factory default Setting Capability for
      RESTCONF";
  }

  feature factory-default-as-datastore {
    description "Indicates that the factory default configuration is
      also available as a separate datastore";
  }

  rpc reset-datastore {
    description "The target datastore is reset to its factory
      default content. ";

    input {
      leaf-list target-datasore {
        type identityref {
          base "ds:datastore" ;
        }
        min-elements 1;
        description "The datastore(s) whose content will be
          replaced by the factory-default configuration.";
      }
      // Do we need an extra parameter that may order a restart of
```

```
      // the YANG-server or the whole system?
    }
  }

  identity factory-default {
    if-feature factory-default-as-datastore;
    base ds:datastore;
    description "The read-only datastore contains the configuration that
      will be copied into e.g. the running datastore by the
      reset-datastore operation if the target is the running
      datastore.";
  }

augment /nc:copy-config/nc:input/nc:source/nc:config-source {
     if-feature factory-default-as-datastore;
     description " Allows the copy-config operation to use the
       factory-default datastore as a source";
     leaf factory-default {
         type empty ;
         description
           "The factory-default datastore is the source.";    }
   }
}
<CODE ENDS>
```

5. IANA Considerations

This document registers one URI in the IETF XML Registry [RFC3688]. The following registration has been made:

URI: urn:ietf:params:xml:ns:yang:ietf-factory-default

Registrant Contact: The IESG.

XML: N/A, the requested URI is an XML namespace.

This document registers one YANG module in the YANG Module Names Registry [RFC6020]. The following registration has been made:

name: ietf-factory-default

namespace: urn:ietf:params:xml:ns:yang:ietf-factory-default

prefix: fdef

RFC: xxxx

6. Security Considerations

The <reset-datastore> RPC can overwrite important and security sensitive information in one of the other datastores e.g. running, therefore it is important to restrict access to this RPC using the standard access control methods. [RFC8341]

The content of the factory-default datastore is usually not security sensitive as it is the same on any device of a certain type.

7. Acknowledgements

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9. References

9.1. Normative References

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[RFC8341] Bierman, A. and M. Bjorklund, "Network Configuration Access Control Model", STD 91, RFC 8341, DOI 10.17487/RFC8341, March 2018, <https://www.rfc-editor.org/info/rfc8341>.

[RFC8342] Bjorklund, M., Schoenwaelder, J., Shafer, P., Watsen, K., and R. Wilton, "Network Management Datastore Architecture (NMDA)", RFC 8342, DOI 10.17487/RFC8342, March 2018, <https://www.rfc-editor.org/info/rfc8342>.

9.2. Informative References

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Watsen, K., Abrahamsson, M., and I. Farrer, "Zero Touch Provisioning for Networking Devices", draft-ietf-netconf-zerotouch-25 (work in progress), September 2018.

[I-D.ietf-netmod-yang-instance-file-format]
Lengyel, B. and B. Claise, "YANG Instance Data File Format", draft-ietf-netmod-yang-instance-file-format-00 (work in progress), November 2018.

Appendix A. Open Issues

- Do we need a restart after <reset-datastore> ? What kind of restart, just the YANG-Server or the full system?

- Do we need the concept of reboot? How is that different from a restart? Does it result in some sort of reset-datastore?

Appendix B. Difference between <startup> datastore and <factory-default> datastore

When the device first boots up, the content of the <startup> and <factory-default> will be identical. The content of <startup> can be subsequently changed by using <startup> as a target in a <copy-config> operation. The <factory-default> is a read-only datastore and it is usually static as described in earlier sections.

Appendix C. Changes between revisions

v01 - v02

- Add copy-config based on Rob's comment.

- Reference Update.

v3 - v00 - v01

- Changed name from draft-wu-netconf-restconf-factory-restore to draft-wu-netmod-factory-default

- Removed copy-config ; reset-datastore is enough

v02 - v03

- Restructured

- o Made new datastore optional
- o Removed Netconf capability
- o Listed Open issues

v01 - v02

- o -

v00 - v01

- o -

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