

NETMOD Working Group
Internet-Draft
Intended status: Standards Track
Expires: June 6, 2020

Q. Wu
Huawei
B. Lengyel
Ericsson Hungary
Y. Niu
Huawei
December 4, 2019

Factory Default Setting
draft-ietf-netmod-factory-default-08

Abstract

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

A new factory-reset RPC is defined. When resetting a datastore, all previous configuration settings will be lost and replaced by the factory-default content.

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

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <https://datatracker.ietf.org/drafts/current/>.

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."

This Internet-Draft will expire on June 6, 2020.

Internet-Draft

Factory Default Setting

December 2019

Copyright Notice

Copyright (c) 2019 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<https://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

1.	Introduction	2
1.1.	Terminology	3
2.	Factory-Reset RPC	3
3.	Factory-Default Datastore	4
4.	YANG Module	5
5.	IANA Considerations	7
6.	Security Considerations	7
7.	Acknowledgements	8
8.	Contributors	8
9.	References	8
9.1.	Normative References	8
9.2.	Informative References	9
Appendix A.	Changes between revisions	9
	Authors' Addresses	11

[1.](#) Introduction

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

A factory-reset RPC is defined. When resetting a datastore, all previous configuration settings will be lost and replaced by the factory-default content.

A "factory-default" read-only datastore is defined, that contains the data to replace the contents of implemented read-write conventional configuration datastores at reset. This datastore can also be used in <get-data> operation.

NETCONF defines the <delete-config> RPC operation, but that only acts on the <startup-datastore>, whereas the <factory-reset> RPC operation can perform additional changes to the device to fully reset the device back to a factory-default state

The YANG data model in this document conforms to the Network Management Datastore Architecture defined in [[RFC8342](#)].

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](#)] [[RFC7950](#)] and are not redefined here:

- o server
- o startup configuration datastore
- o candidate configuration datastore
- o running configuration datastore
- o intended configuration datastore
- o operational state datastore
- o conventional configuration datastore
- o RPC operation

The following terms are defined in this document as follows:

- o factory-default datastore: A read-only configuration 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. Factory-Reset RPC

A new "factory-reset" RPC is introduced. Upon receiving the RPC

- o All supported conventional read-write configuration datastores (i.e. <running>, <startup>, and <candidate>) are all reset to the contents of <factory-default>.
- o Read-only datastores receive their content from other datastores (e.g. <intended> gets its content from <running>).
- o All data in any ephemeral datastores MUST be discarded.
- o The contents of the <operational> datastore MUST be reset back to an appropriate factory-default state.

In addition, the "factory-reset" RPC MUST restore storage to factory condition, including remove log files, remove temporary files (from datastore or elsewhere). It MUST also remove security credentials and restoring default security settings including remove certificates, keys, zero passwords, etc. The process invoked by the "factory-reset" RPC SHOULD zero/pattern-write than remove sensitive files such as the TLS keys, configuration stores, etc. The "factory-reset" RPC MAY also be used to trigger some other resetting tasks such as restarting the node or some of the software processes, which are especially needed after having onboard information being processed or when a specified boot image needs to be downloaded, verified and installed.

3. Factory-Default Datastore

Following guidelines for defining Datastores in the [appendix A of \[RFC8342\]](#), this document introduces a new optional datastore resource

named 'factory-default' that represents a preconfigured minimal initial configuration that can be used to initialize the configuration of a server. A device MAY only implement the <factory-reset> RPC without implementing the 'factory-default' datastore, which make it lose the ability to see what configuration the device would be reset back to.

- o Name: "factory-default"
- o YANG modules: all
- o YANG nodes: all "config true" data nodes
- o Management operations: The content of the datastore is set by the 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 datastore can be read using the standard NETCONF/RESTCONF protocol operations. The <factory-reset> operation copies the factory

default content to <running> and, if present, <startup> and then the content of these datastores is propagated automatically to any other read only datastores, e.g., <intended> and <operational>.

- o 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.

The contents of <factory-default> MUST persist across device restarts.

4. YANG Module

This module imports typedefs from [[RFC8342](#)], and it references [[RFC6421](#)], [[RFC8341](#)].

```
<CODE BEGINS> file "ietf-factory-default@2019-11-27.yang"
module ietf-factory-default {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-factory-default";
  prefix fd;

  import ietf-datastores {
    prefix ds;
  }
  import ietf-netconf-acm {
    prefix nacm;
  }

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

    Editor: Qin Wu
           <mailto:bill.wu@huawei.com>
    Editor: Balazs Lengyel
           <mailto:balazs.lengyel@ericsson.com>
    Editor: Ye Niu
           <mailto:niuye@huawei.com>";
```

description

"This module defines the

- factory-reset RPC
- factory-default datastore

It provides functionality to reset a server to its factory-default content.

Copyright (c) 2019 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
(<http://trustee.ietf.org/license-info>).

This version of this YANG module is part of RFC XXXX;
see the RFC itself for full legal notices.";

```
revision 2019-11-27 {
  description
    "Initial revision.";
  reference
    "RFC XXXX: Factory default Setting";
}

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

rpc factory-reset {
  nacm:default-deny-all;
  description
    "The server resets the content of all read-write
    configuration datastores (i.e., <running> , <startup>, and
    <candidate>) to their factory default content.";
}

identity factory-default {
  if-feature "factory-default-datastore";
  base ds:datastore;
  description
    "This read-only datastore contains the configuration data used to
    replace the contents of the read-write conventional configuration
```

```
    datastores during a factory-reset RPC operation.";
  }
}
```

<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: fd

RFC: xxxx

[6.](#) Security Considerations

The YANG module defined in this document extends the base operations for NETCONF [[RFC6241](#)] and RESTCONF [[RFC8040](#)]. The lowest NETCONF layer is the secure transport layer, and the mandatory-to-implement secure transport is Secure Shell (SSH) [[RFC6242](#)]. The lowest RESTCONF layer is HTTPS, and the mandatory-to-implement secure transport is TLS [[RFC8446](#)].

The <factory-reset> RPC operation may be considered sensitive in some network environments, e.g., remote access to reset the device or overwrite 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 'factory-reset' RPC can prevent any further management of the

device if the session and client config is included in the factory-reset contents.

The operational disruption caused by setting the config to factory-reset contents varies greatly depending on the implementation and current config.

7. Acknowledgements

Thanks to Juergen Schoenwaelder, Ladislav Lhotka, Alex Campbell, Joe Clarke, Robert Wilton, Kent Watsen, Joel Jaeggli, Lou Berger, Andy Bierman, Susan Hares to review this draft and provide important input to this document.

8. Contributors

Rohit R Ranade
Huawei
Email: rohitrranade@huawei.com

9. References

9.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC7950] Bjorklund, M., Ed., "The YANG 1.1 Data Modeling Language", [RFC 7950](#), DOI 10.17487/RFC7950, August 2016, <<https://www.rfc-editor.org/info/rfc7950>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.
- [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

[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-06](#) (work in progress), December 2019.

[Appendix A.](#) Changes between revisions

Editorial Note (To be removed by RFC Editor)

v07 - 08

- o Provide clarification and recommendation on the relationship between factory-reset RPC and reboot.
- o Nits fixed based on YANG Doctor Review.

v06 - 07

- o Remove Factory-default content specification;
- o Remove reference to YANG instance data file format and zero touch provision [[RFC8573](#)];
- o Remove copy-config operation extension on factory-default datastore

v05 - 06

- o Additional text to enhance security section.
- o Add nacm:default-deny-all on "factory-reset" RPC.
- o A few clarification on Factory-default content specification.

v03 - 04

- o Additional text to clarify factory-reset RPC usage.

v02 - 03

- o Update security consideration section.

v01 - v02

- o Address security issue in the security consideration section.

- o Remove an extension to the NETCONF <copy-config> operation which allows it to operate on the factory-default datastore.
- o Add an extension to the NETCONF <get-config> operation which allows it to operate on the factory-default datastore.

v00 - v01

- o Change YANG server into server defined in NMDA architecture based on discussion.
- o Allow reset the content of all read-write configuration datastores to its factory-default content except <candidate>.
- o Add clarification text on factory-reset protocol operation behavior.

v03 - v00

- o Change draft name from [draft-wu](#) to [draft-ietf-netmod-factory-default-00](#) without content changes.

v02 - v03

- o Change reset-datastore RPC into factory-reset RPC to allow reset the whole device with factory default content.
- o Remove target datastore parameter from factory-reset RPC.
- o Other editorial changes.

v01 - v02

- o Add copy-config based on Rob's comment.
- o Reference Update.

v03 - v00 - v01

- o Changed name from [draft-wu-netconf-restconf-factory-restore](#) to [draft-wu-netmod-factory-default](#)
- o Removed copy-config ; reset-datastore is enough

v02 - v03

- o Restructured

Wu, et al.

Expires June 6, 2020

[Page 10]

Internet-Draft

Factory Default Setting

December 2019

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

v01 - v02

- o -

v00 - v01

- o -

Authors' Addresses

Qin Wu
Huawei
101 Software Avenue, Yuhua District
Nanjing, Jiangsu 210012
China

Email: bill.wu@huawei.com

Balazs Lengyel
Ericsson Hungary
Magyar Tudosok korutja 11
1117 Budapest
Hungary

Phone: +36-70-330-7909

Email: balazs.lengyel@ericsson.com

Ye Niu
Huawei

Email: niuye@huawei.com

Wu, et al.

Expires June 6, 2020

[Page 11]