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Factory Default Setting **draft-ietf-netmod-factory-default-10**

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 device, 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 factory default configuration for the device.

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[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 device, 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 the <get-data> operation.

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: a preconfigured initial configuration that is used to initialize the configuration of a server.
- o factory-default datastore: A read-only configuration datastore holding a preconfigured initial configuration that is used to initialize the configuration of a server.

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 reflect the operational state of the device after applying the factory default configuration.

In addition, the "factory-reset" RPC MUST restore non-volatile storage to factory condition. Depending on the system, this may entail deleting dynamically generated files, such as those containing keys (e.g., /etc/ssl/private), certificates (e.g., /etc/ssl), and logs (e.g., /var/log), temporary files (e.g., /tmp/*). All security sensitive data (i.e., private keys, passwords, etc.) SHOULD be overwritten with zeros or a pattern before deletion. 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.

Note that operators should be aware that since all read-write datastores are immediately reset to factory-default, the device may become unreachable on the network. It is important to understand how a given vendor's device will behave after the RPC is executed. Implementors SHOULD reboot the device or otherwise restart processes needed to bootstrap it.

3. Factory-Default Datastore

Following the 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 implement the <factory-reset> RPC without implementing the "factory-default" datastore, which would only eliminate the ability to programmatically determine the factory-default configuration.

- 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> <candidate> 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 contents of <factory-default> is defined by the device vendor and 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;
    reference
      "RFC 8342: Network Management Datastore Architecture (NMDA)";
  }
  import ietf-netconf-acm {
    prefix nacm;
    reference
      "RFC8341: Network Configuration Access Control Model";
  }

  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
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  description
    "This module defines an RPC called 'factory-reset', a
     datastore identity called 'factory-default-datastore'.
```


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

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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 factory-default
    configuration for the device 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](#)].

Access to the <factory-reset> RPC operation is considered sensitive in and therefore has been restricted using the "default- deny-all" access control defined in . [[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.

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9. References

9.1. Normative References

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- [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)

v09 - 10

- o Incorporate Shepherd review's comments.

v08 - 09

- o Provide some guideline for operators and implementor who implement factory default method.

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

v01 - v02

o -

v00 - v01

o -

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