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Notification Capabilities Model Extension for self-explanation data Node  
tag capability support  
draft-[tao-netconf-notif-node-tag-capabilities-00](#)

Abstract

Before a client application subscribes to updates from a datastore, server capabilities related to "Subscription to YANG Datastores" can be advertised using YANG Instance Data format. These server capabilities can be documented at implement time or reported at run-time.

This document proposes a YANG module for Data Node tag capability support which augments YANG Push Notification Capabilities model and provide additional self-explanation data node attributes associated with node selector within per-node capabilities.

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Table of Contents

- 1. Introduction . . . . . 2
- 1.1. Terminology . . . . . 3
- 2. Notification Capability Model Extension . . . . . 3
- 2.1. Tree Diagram . . . . . 4
- 3. YANG Module . . . . . 4
- 4. IANA Considerations . . . . . 5
- 4.1. Updates to the IETF XML Registry . . . . . 5
- 4.2. Updates to the YANG Module Names Registry . . . . . 6
- 5. Security Considerations . . . . . 6
- 6. References . . . . . 6
- 6.1. Normative References . . . . . 7
- 6.2. Informative References . . . . . 8
- Authors' Addresses . . . . . 8

**1. Introduction**

As described in [I-D.netconf-notification-capabilities], a server supporting YANG-Push MAY have a number of capabilities such as

- o Supported (reporting) periods for periodic subscriptions
- o Maximum number of objects that can be sent in an update
- o Supported dampening periods for on-change subscriptions
- o The set of data nodes for which on-change notification is supported

Notification capability model defined in [I-D.netconf-notification-capabilities] allows a client to discover YANG-Push related capabilities both at implementation-time and run-time. Without using notification capability, it might lead to unexpected failure or additional message exchange for NETCONF clients to discover data models supported by a NETCONF server.

When the state of all subscriptions of a particular Subscriber to be fetched is huge, filtering queries of operational state on a server based on server capabilities can greatly reduce the amount of data to be streamed out to the destination.



However without self-explanation information on data node conveyed in Notification capability model [I-D.netconf-notification-capabilities], it is hard for NETCONF clients to automatically select which data objects are of interest using machine to machine interface, e.g., identify a set of objects which have a common characteristic, collect specific object type nodes.

This document proposes a YANG module for Data Node tag capability support which augments YANG Push Notification Capabilities model and provide additional self-explanation data node tag attributes associated with node selector for queries filtering.

### **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.

## **2. Notification Capability Model Extension**

The YANG module `ietf-notification-capabilities` defined in [I-D.netconf-notification-capabilities] specify the following server capabilities related to YANG Push:

- o a set of capabilities related to the amount of notifications the server can send out
- o specification of which data nodes support on-change notifications.
- o Capability values can be specified on server level, datastore level or on specific data nodes (and their contained sub-tree) of a specific datastore. Capability values on a smaller, more specific part of the server's data always override more generic values.
- o On-change capability is not specified on a server level as different datastores usually have different on-change capabilities. On a datastore level on-change capability for configuration and state data can be specified separately.

These server capabilities can be provided either at implementation time or reported at run time.

This document augments YANG Push Notification Capabilities model and provide additional data node attributes associated with node selector within per-node capabilities:



- o specification of which object type nodes they can push to the target recipient.
- o specification of which group of data nodes they can push to the target recipient.

### 2.1. Tree Diagram

The following tree diagram [RFC8340] provides an overview of the data model.

```
module: ietf-notification-node-tag-capabilities
  augment /inc:datastore-subscription-capabilities/inc:datastore-
capabilities
    /inc:per-node-capabilities:
      +-ro node-tag          tags:tag
      +-ro group-id         string
```

### 3. YANG Module

```
<CODE BEGINS> file "ietf-notification-node-tag-capabilities.yang"
module ietf-notification-node-tag-capabilities {
  yang-version 1.1;
  namespace urn:ietf:params:xml:ns:yang:ietf-notification-node-tag-
capabilities;
  prefix nntc;

  import ietf-notification-capabilities { prefix inc ; }
  import ietf-data-node-tags {prefix ntags;}
  organization
    "IETF NETMOD (Network Modeling) Working Group";
  contact
    "WG Web: <https://tools.ietf.org/wg/netconf/>
    WG List: <mailto:netconf@ietf.org>

    Editor: Ran Tao
           <mailto:taoran20@huawei.com>";
  description
    "This module defines an extension to YANG Push
    Notification Capabilities model and provides additional data node tag
    attributes associated with node selector for queries filtering.
```

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 \(RFC 2119\)](#) ([RFC 8174](#)) when, and only when, they appear in all capitals, as shown here.

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[Page 4]

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

```
augment /inc:datastore-subscription-capabilities/inc:datastore-capabilities
  /inc:per-node-capabilities {
  description "Allows the get-config operation to use the
    factory-default datastore as a source";
    leaf node-tag {
      type ntags:node-tag ;
      description
        "Tags associated with the data node within YANG module.
        See the IANA 'YANG Data Node Tag Prefixes' registry
        for reserved prefixes and the IANA
        'IETF YANG Data Node Tags' registry for IETF tags.";
    }
    leaf group-id {
      type string;
      description
        "This group ID is used to identify a set of data nodes
        of the same group which have a common characteristic.";
    }
  }
}
<CODE ENDS>
```

## 4. IANA Considerations

### 4.1. Updates to the IETF XML Registry

This document registers a URI in the "IETF XML Registry" [[RFC3688](#)]. Following the format in [[RFC3688](#)], the following registration has been made:

URI:

urn:ietf:params:xml:ns:yang:ietf-notification-node-tag-capabilities

Registrant Contact:

The IESG.

XML:

N/A; the requested URI is an XML namespace.





#### **4.2. Updates to the YANG Module Names Registry**

This document registers one YANG module in the "YANG Module Names" registry [RFC6020]. Following the format in [RFC6020], the following registration has been made:

name:

ietf-notification-node-tag-capabilities

namespace:

urn:ietf:params:xml:ns:yang:ietf-notification-node-tag-capabilities

prefix:

nntc

reference:

RFC XXXX (RFC Ed.: replace XXX with actual RFC number and remove this note.)

#### **5. Security Considerations**

The YANG module specified in this document defines a schema for data that is designed to be accessed via network management protocols such as NETCONF [RFC6241] or 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 NETCONF Configuration Access Control Model (NACM) [RFC8341] provides the means to restrict access for particular NETCONF or RESTCONF users to a preconfigured subset of all available NETCONF or RESTCONF protocol operations and content.

There are a number of data nodes defined in this YANG module that are writable/creatable/deletable (i.e., config true, which is the default). These data nodes may be considered sensitive in some network environments. Write operations (e.g., edit-config) to these data nodes without proper protection can have a negative effect on network operations. These are the subtrees and data nodes and their sensitivity/vulnerability:

#### **6. References**



## **6.1. Normative References**

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[RFC8446] Rescorla, E., "The Transport Layer Security (TLS) Protocol Version 1.3", [RFC 8446](#), DOI 10.17487/RFC8446, August 2018, <<https://www.rfc-editor.org/info/rfc8446>>.

## 6.2. Informative References

[RFC3688] Mealling, M., "The IETF XML Registry", [BCP 81](#), [RFC 3688](#), DOI 10.17487/RFC3688, January 2004, <<https://www.rfc-editor.org/info/rfc3688>>.

[RFC6020] Bjorklund, M., Ed., "YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF)", [RFC 6020](#), DOI 10.17487/RFC6020, October 2010, <<https://www.rfc-editor.org/info/rfc6020>>.

[RFC8340] Bjorklund, M. and L. Berger, Ed., "YANG Tree Diagrams", [BCP 215](#), [RFC 8340](#), DOI 10.17487/RFC8340, March 2018, <<https://www.rfc-editor.org/info/rfc8340>>.

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