

NETCONF  
Internet-Draft  
Intended status: Standards Track  
Expires: 16 October 2026

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14 April 2026

Subscription to Notifications in a Distributed Architecture  
draft-ietf-netconf-distributed-notif-19

Abstract

This document describes extensions to the YANG notifications subscription to allow metrics being published directly from processors on line cards to target receivers, while subscription is still maintained at the route processor in a distributed forwarding system of a network node.

Requirements Language

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.

Status of This Memo

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## Table of Contents

1. Introduction . . . . .	2
2. Terminologies . . . . .	3
3. Motivation and Solution Overview . . . . .	4
4. Solution Detail . . . . .	5
5. Subscription Decomposition . . . . .	7
6. Publication Composition . . . . .	8
7. Subscription State Change Notifications . . . . .	8
8. Publisher Configurations . . . . .	8
9. YANG Tree . . . . .	9
10. YANG Module . . . . .	9
11. IANA Considerations . . . . .	12
12. Implementation Status . . . . .	12
12.1. Huawei VRP . . . . .	12
12.2. 6WIND VSR . . . . .	13
13. Operational Considerations . . . . .	13
14. Security Considerations . . . . .	13
15. Contributors . . . . .	14
16. Acknowledgements . . . . .	14
17. References . . . . .	14
17.1. Normative References . . . . .	14
17.2. Informative References . . . . .	15
Appendix A. Examples . . . . .	17
Authors' Addresses . . . . .	18

## 1. Introduction

The mechanism to support a subscription of a continuous and customized stream of updates from a YANG datastore [RFC8342] is defined in [RFC8639] and [RFC8641]. Requirements for Subscription to YANG Datastores are defined in [RFC7923].

By streaming YANG-Push notifications from publishers to receivers, much better performance and fine-grained sampling can be achieved than with a polling-based mechanism. In a distributed forwarding system on a network node, the packet forwarding is delegated to multiple processors on line cards. In order not to overwhelm the route processor resources, it is not uncommon that data records are published directly from processors on line cards to target receivers to further increase efficiency on the routing system.

This document complements the general subscription requirements defined in Section 4.2.1 of [RFC7923] by adding the paragraph: A Subscription Service MAY support the ability to export from multiple software processes on a single routing system and expose the information which software process produced which message.

## 2. Terminologies

The following terms are defined in [RFC8639] and are not redefined here:

Subscriber

Publisher

Receiver

Subscription

The following terms are used with "ietf-notification-capabilities" in Section 3 of [RFC9196] and are not redefined here:

Notification Capabilities

In addition, this document defines the below terms. Some of these terms are distinguished between Network Node versus Component and Parent versus Agent to distinguish their role within the distributed system. Network Node and Component is used to distinguish wherever the system component is reachable outside the distributed system or not. Parent and Agent is used to distinguish wherever it manages or is being managed within the distributed system.

Component: Refers to a network device component, such as a processor on a line card within a distributed routing system.

Network Node Subscription: The Subscription requested by the Subscriber as described in Sections 2.4 and 2.5 of [RFC8639]. It may be decomposed into multiple Component Subscriptions.

**Component Subscription:** The Subscription that defines a data source which is managed and controlled by a single Publisher.

**Network Node Notification Capabilities:** The overall notification capabilities that the group of Publishers can expose to the Subscriber as defined in Section 5.1 of [RFC9196] for the distributed system. This includes which YANG nodes can be subscribed at which minimum-update-period for periodical subscriptions respectively which minimum-dampening-period for on-change subscriptions.

**Component Notification Capabilities:** The notification capabilities that each Publisher exposes to the Publisher Parent. This includes which YANG nodes with which minimum-update-period for periodical subscriptions respectively which minimum-dampening-period for on-change subscriptions can be subscribed on which Component.

**Publisher Parent:** The component of a Publisher that interacts with the Subscriber to deal with the Network Node Subscription. It decomposes the Network Node Subscription to multiple Component Subscriptions and interacts with the Publisher Agents.

**Publisher Agent:** The component of a Publisher that interacts with the Publisher Parent to deal with the Component Subscription and pushing the data to the Receiver.

**Network Node:** Is the network node of a distributed system which contains one or more Publishers that obtains the data from the YANG datastore and pushes it to the Receiver.

**Message Publisher:** The Publisher that pushes the message to the Receiver.

**Message Publisher ID:** A 32-bit identifier of the publishing process that is locally unique to the Network Node. With this identifier the publishing process from where the message was published from can be uniquely identified. Receivers SHOULD use the transport session and the Publisher ID field to separate different publisher streams originating from the same network Node.

### 3. Motivation and Solution Overview

In a distributed forwarding system of a Network Node much YANG data is subscribed to many Components, processors on line cards, but published from a single route processor instead. This creates an unnecessary overhead at the route processor and a potential bottleneck. Publishing the YANG data directly from the Components avoids this inefficiency.

This document proposes that subscribed YANG data can be published from Components for Section 2.5 of YANG-Push configured subscriptions [RFC8639]. The route processor is only involved in maintaining and decomposing the Subscription, which includes notifying the Receiver which Subscription is being published from which Component with subscription state change notifications.

To enable Receivers to map notification messages to a particular Publisher, the Message Publisher ID in the transport message header of the YANG notification message is introduced. In case of UDP transport, this is described in Section 3.2 of [I-D.ietf-netconf-udp-notif]. With unique sequence-numbers per publishing process described in Section 3.2.1 of [I-D.ietf-netconf-notif-envelope], each message can uniquely be identified, loss recognized and related to a transport session and publishing process.

#### 4. Solution Detail

Figure 1 below shows the distributed data export framework.

A collector usually includes two components,

- \* the Subscriber generates the subscription instructions to express what and how the Receiver wants to receive the data;
- \* the Receiver is the target for the data publication.

For one subscription, there can be one or more Receivers. And the Subscriber does not necessarily share the same IP address as the Receivers.

In this framework, the Publisher pushes messages to the Receiver according to the subscription. The Publisher is either in the Parent or Agent role. The Publisher Parent knows all the capabilities that his Agents can provide and exposes the Network Node Notification Capabilities to the collector. The Subscriber maintains the Network Node Subscription at the Publisher Parent and disassembles the Network Node Subscription to multiple Component Subscriptions, depending upon which source data is needed. The Component Subscriptions are then distributed to the corresponding Publisher Agents on route and processors on line cards.

Publisher Agents collect metrics according to the Component Subscription, add its metadata, encapsulates, and pushes messages. Messages may require segmentation depending on the amount of YANG data subscribed and maximum transmission unit of the interface where the message is published from. Implementations MUST NOT rely on IP fragmentation to carry large messages. The Receiver then decapsulates packets and reassembles notifications accordingly.

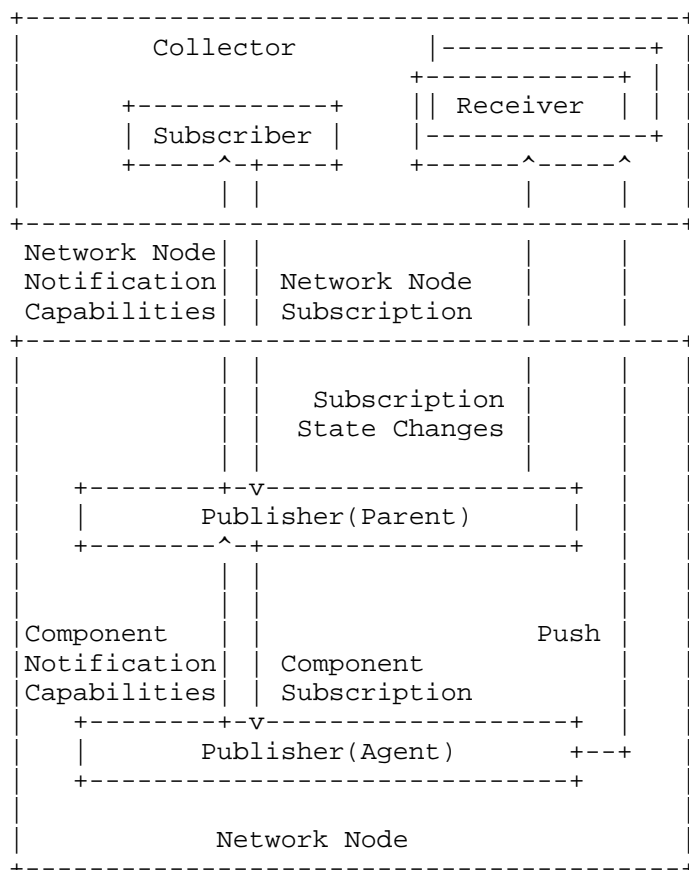


Figure 1: The Distributed Data Export Framework

Publisher Parent and Publisher Agents interact with each other in several ways:

- \* Publisher Agents need to register with the Parent at the beginning of their process life cycle.

- \* Contracts are created and maintained throughout the subscription lifecycle between the Publisher Parent and each Agent and on its Component Notification Capabilities, and the format for notification data structure.
- \* The Publisher Parent relays the component subscriptions to the Publisher Agents.
- \* The Publisher Agents announce the status of their Component Subscriptions to the Publisher Parent. The status of the overall subscription is maintained by the Publisher Parent. The Publisher Parent is responsible for notifying the subscriber in case of problems with the Component Subscriptions.

The technical mechanisms or protocols used for the coordination of operational information between Publisher Parent and Agent is out of scope of this document.

## 5. Subscription Decomposition

The Collector can send subscription requests only to the Parent. This requires the Publisher Parent to:

1. expose the Network Node Notification Capabilities that can be served by multiple Publisher Agents;
2. disassemble the Network Node Subscription to multiple Component Subscriptions, and distribute them to the Publisher Agents of the corresponding metric sources from the YANG schema tree so that they do not overlap; How the subscription is being distributed is implementation specific and not part of this document.
3. notify changes related to the existing subscriptions to the different Publisher Agents.

And the Publisher Agent to:

- \* Inherit the Network Node Subscription properties from Publisher Parent for its Component Subscription;
- \* share the same life-cycle as the Network Node Subscription;
- \* share the same Subscription ID as the Network Node Subscription.

## 6. Publication Composition

The Publisher Agent collects data and encapsulates the packets per Component Subscription. The format and structure of the data records are defined by the YANG schema, so that the decomposition at the Receiver can benefit from the structured and hierarchical data records.

The Receiver can associate the YANG data records with Subscription ID [RFC8639] to the subscribed subscription. Additionally, it can use the Message Publisher ID to determine the corresponding publisher process.

The "subscription-started" and "subscription-modified" notification defined in [RFC8639] and "push-update" and "push-change-update" notification defined in [RFC8641] MUST also include a list of Message Publisher IDs to notify the current Publishers for the corresponding Network Node Subscription.

## 7. Subscription State Change Notifications

In addition to sending event records to Receivers, the Parent MUST also send subscription state change notifications [RFC8639] when events related to subscription management have occurred. All the subscription state change notifications MUST be delivered by the Parent.

When the subscription decomposition result changes, the "subscription-modified" notification MUST be sent to indicate the new list of Publisher Agents.

## 8. Publisher Configurations

This document assumes that all Publisher Agents are preconfigured to push data. Publisher Agents that send data are selected based on the subscription decomposition result.

From the Receivers perspective, all Publisher Agents share the same source IP address for data export. How connectivity is established within the distributed system architecture is out of scope of this document. For connectionless data transport such as UDP based transport [I-D.ietf-netconf-udp-notif] the same Layer 4 source port for data export can be used. For connection based data transport such as HTTPS based transport [I-D.ietf-netconf-https-notif], each Publisher Agent MUST be able to acknowledge packet retrieval from Receivers, and therefore requires a dedicated Layer 4 source port per software process.

The specific configuration on transports is described in the respective documents.

## 9. YANG Tree

```
module: ietf-distributed-notif

  augment /sn:subscriptions/sn:subscription:
    +--ro message-publisher-id*   uint32
  augment /sn:subscription-started:
    +--ro message-publisher-id*   uint32
  augment /sn:subscription-modified:
    +--ro message-publisher-id*   uint32
  augment /yp:push-update:
    +--ro message-publisher-id?   uint32
  augment /yp:push-change-update:
    +--ro message-publisher-id?   uint32
```

Figure 2: YANG tree diagram for 'ietf-distributed-notif' module.

## 10. YANG Module

This YANG module imports definitions from [RFC8639] and [RFC8641].

```
<CODE BEGINS> file "ietf-distributed-notif@2026-04-13.yang"
module ietf-distributed-notif {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-distributed-notif";
  prefix dn;

  import ietf-subscribed-notifications {
    prefix sn;
    reference
      "RFC 8639: Subscription to YANG Notifications";
  }
  import ietf-yang-push {
    prefix yp;
    reference
      "RFC 8641: Subscription to YANG Notifications for Datastore
      Updates";
  }

  organization
    "IETF NETCONF (Network Configuration) Working Group";
  contact
    "WG Web:   <https://datatracker.ietf.org/wg/netconf/>
    WG List:  <mailto:netconf@ietf.org>
```

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description

"Defines augmentation for ietf-subscribed-notifications to enable the distributed publication with single subscription.

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All revisions of IETF and IANA published modules can be found at the YANG Parameters registry (<https://www.iana.org/assignments/yang-parameters>).

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

```
revision 2026-04-13 {
  description
    "Initial version";
  reference
    "RFC XXXX: Subscription to Notifications in a Distributed
      Architecture";
}

grouping message-publisher-id {
  description
    "Provides a reusable message-publisher-id leaf.";
  leaf message-publisher-id {
    type uint32;
    config false;
    description
      "Identifies the Component software process which publishes
        notification messages (e.g., processor 1 on line card 1). This
```

```
        field is used to notify the receiver which publisher process
        published which message. The identifier is locally unique to
        the Network Node.";
    }
}

grouping message-publisher-ids {
  description
    "Provides a reusable message-publisher-id-list leaf-list.";
  leaf-list message-publisher-id {
    type uint32;
    config false;
    description
      "Identifies the Component software process which publishes
      notification messages (e.g., processor 1 on line card 1). This
      field is used to notify the receiver which publisher processes
      are going to publish. The identifiers are locally unique to
      the Network Node.";
  }
}

augment "/sn:subscriptions/sn:subscription" {
  description
    "This augmentation allows the Message
    Publisher ID to be exposed for a subscription.";
  uses message-publisher-ids;
}

augment "/sn:subscription-started" {
  description
    "This augmentation adds the Message Publisher ID to the
    subscription-started subscription change notifications.";
  uses message-publisher-ids;
}

augment "/sn:subscription-modified" {
  description
    "This augmentation adds the Message Publisher ID to the
    subscription-modified subscription change notifications.";
  uses message-publisher-ids;
}

augment "/yp:push-update" {
  description
    "This augmentation adds the Message Publisher ID in the
    push-update notification.";
  uses message-publisher-id;
}
```

```
augment "/yp:push-change-update" {  
  description  
    "This augmentation adds the Message Publisher ID in the  
    push-change-update notification.";  
  uses message-publisher-id;  
}  
}  
<CODE ENDS>
```

## 11. IANA Considerations

This document registers the following namespace URI in the IETF XML Registry [RFC3688]:

URI: urn:ietf:params:xml:ns:yang:ietf-distributed-notif

Maintained by IANA? N

Registrant Contact: The IESG.

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

This document registers the following YANG module in the YANG Module Names registry [RFC3688]:

Name: ietf-distributed-notif

Maintained by IANA? N

Namespace: urn:ietf:params:xml:ns:yang:ietf-distributed-notif

Prefix: dn

Reference: RFC XXXX

## 12. Implementation Status

Note to the RFC-Editor: Please remove this section before publishing.

### 12.1. Huawei VRP

Huawei implemented the Subscription Decomposition described in this document for a YANG-Push publisher on UDP-based Transport for Configured Subscriptions [I-D.ietf-netconf-udp-notif] in their VRP platform.

## 12.2. 6WIND VSR

6WIND implemented the Subscription Decomposition described in this document for a YANG-Push publisher on UDP-based Transport for Configured Subscriptions [I-D.ietf-netconf-udp-notif] in their VSR platform.

## 13. Operational Considerations

This document enables that subscriptions can be distributed among multiple Component subscriptions. The ietf-distributed-notif YANG Module (Section 10) extends the Subscription state change, push-update and push-change-update notifications. In Subscription state change notifications it describes from which YANG-Push Publisher IDs notifications are going to be published from. In push-update and push-change-update notifications it describes from which YANG-Push Publisher ID the notification was published from.

Both is important for operations to monitor at the YANG-Push Receiver wherever all Components are publishing notifications and thanks to unique sequence-numbers per publishing process Section 3.2.1 of [I-D.ietf-netconf-notif-envelope] and timestamp per message Section 3.3.1 of [I-D.ietf-netconf-notif-envelope] delay and loss per message and publishing process can be calculated.

## 14. Security Considerations

This section uses the template described in Section 3.7 of [I-D.ietf-netmod-rfc8407bis].

The 'ietf-distributed-notif' YANG module defines a data model that is designed to be accessed via YANG-based management protocols, such as NETCONF [RFC6241] and RESTCONF [RFC8040]. These YANG-based management protocols (1) have to use a secure transport layer (e.g., SSH [RFC6242], TLS [RFC8446], and QUIC [RFC9000]) and (2) have to use mutual authentication.

The Network 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 no data nodes defined in this YANG module that are writable/creatable/deletable (i.e., "config true", which is the default).

Some of the readable data nodes in this YANG module may be considered sensitive or vulnerable in some network environments. It is thus important to control read access (e.g., via get, get-config, or Notification) to these data nodes. Specifically, the following subtrees and data nodes have particular sensitivities/vulnerabilities:

- \* /sn:subscriptions/sn:subscription/dn:message-publisher-id
- \* /sn:subscription-started/dn:message-publisher-id
- \* /sn:subscription-modified/dn:message-publisher-id
- \* /sn:establish-subscription/dn:message-publisher-id

The entries in the list above will show the identity of the originating Publisher process. Exposure of this information may assist an attacker in mapping the distributed system or in injecting spoofed Notifications. Implementations SHOULD ensure that access to this data is restricted and that Notifications are sent over secure and authenticated channels.

Security Considerations defined in [RFC8639] do also apply for this document.

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## 16. Acknowledgements

We thank Kent Watsen, Mahesh Jethanandani, Martin Bjorklund, Tim Carey, Qin Wu, Robert Wilton, Benoit Claise, Alex Huang Feng, Camilo Cardona, Juergen Schoenwaelder, Joel Halpern and Yingzhen Qu for their constructive suggestions for improving this document.

## 17. References

### 17.1. 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>>.
- [RFC3688] Mealling, M., "The IETF XML Registry", BCP 81, RFC 3688, DOI 10.17487/RFC3688, January 2004, <<https://www.rfc-editor.org/info/rfc3688>>.
- [RFC6241] Enns, R., Ed., Bjorklund, M., Ed., Schoenwaelder, J., Ed., and A. Bierman, Ed., "Network Configuration Protocol (NETCONF)", RFC 6241, DOI 10.17487/RFC6241, June 2011, <<https://www.rfc-editor.org/info/rfc6241>>.
- [RFC8040] Bierman, A., Bjorklund, M., and K. Watsen, "RESTCONF Protocol", RFC 8040, DOI 10.17487/RFC8040, January 2017, <<https://www.rfc-editor.org/info/rfc8040>>.
- [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>>.
- [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>>.
- [RFC8639] Voit, E., Clemm, A., Gonzalez Prieto, A., Nilsen-Nygaard, E., and A. Tripathy, "Subscription to YANG Notifications", RFC 8639, DOI 10.17487/RFC8639, September 2019, <<https://www.rfc-editor.org/info/rfc8639>>.
- [RFC8641] Clemm, A. and E. Voit, "Subscription to YANG Notifications for Datastore Updates", RFC 8641, DOI 10.17487/RFC8641, September 2019, <<https://www.rfc-editor.org/info/rfc8641>>.
- [RFC9196] Lengyel, B., Clemm, A., and B. Claise, "YANG Modules Describing Capabilities for Systems and Datastore Update Notifications", RFC 9196, DOI 10.17487/RFC9196, February 2022, <<https://www.rfc-editor.org/info/rfc9196>>.

## 17.2. Informative References

- [I-D.ietf-netconf-https-notif]  
Jethanandani, M. and K. Watsen, "An HTTPS-based Transport for YANG Notifications", Work in Progress, Internet-Draft, draft-ietf-netconf-https-notif-15, 1 February 2024, <<https://datatracker.ietf.org/doc/html/draft-ietf-netconf-https-notif-15>>.
- [I-D.ietf-netconf-notif-envelope]  
Feng, A. H., Francois, P., Graf, T., and B. Claise, "Extensible YANG Model for YANG-Push Notifications", Work in Progress, Internet-Draft, draft-ietf-netconf-notif-envelope-04, 6 February 2026, <<https://datatracker.ietf.org/doc/html/draft-ietf-netconf-notif-envelope-04>>.
- [I-D.ietf-netconf-udp-notif]  
Feng, A. H., Francois, P., Zhou, T., Graf, T., and P. Lucente, "UDP-based Transport for Configured Subscriptions", Work in Progress, Internet-Draft, draft-ietf-netconf-udp-notif-25, 28 January 2026, <<https://datatracker.ietf.org/doc/html/draft-ietf-netconf-udp-notif-25>>.
- [I-D.ietf-netmod-rfc8407bis]  
Bierman, A., Boucadair, M., and Q. Wu, "Guidelines for Authors and Reviewers of Documents Containing YANG Data Models", Work in Progress, Internet-Draft, draft-ietf-netmod-rfc8407bis-28, 5 June 2025, <<https://datatracker.ietf.org/doc/html/draft-ietf-netmod-rfc8407bis-28>>.
- [RFC6242] Wasserman, M., "Using the NETCONF Protocol over Secure Shell (SSH)", RFC 6242, DOI 10.17487/RFC6242, June 2011, <<https://www.rfc-editor.org/info/rfc6242>>.
- [RFC7923] Voit, E., Clemm, A., and A. Gonzalez Prieto, "Requirements for Subscription to YANG Datastores", RFC 7923, DOI 10.17487/RFC7923, June 2016, <<https://www.rfc-editor.org/info/rfc7923>>.
- [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>>.
- [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>>.

[RFC9000] Iyengar, J., Ed. and M. Thomson, Ed., "QUIC: A UDP-Based Multiplexed and Secure Transport", RFC 9000, DOI 10.17487/RFC9000, May 2021, <<https://www.rfc-editor.org/info/rfc9000>>.

## Appendix A. Examples

This appendix is non-normative.

Figure 3 shows a typical configured subscription to the Network Node with distributed data export capability. Subscription request has been removed for brevity.

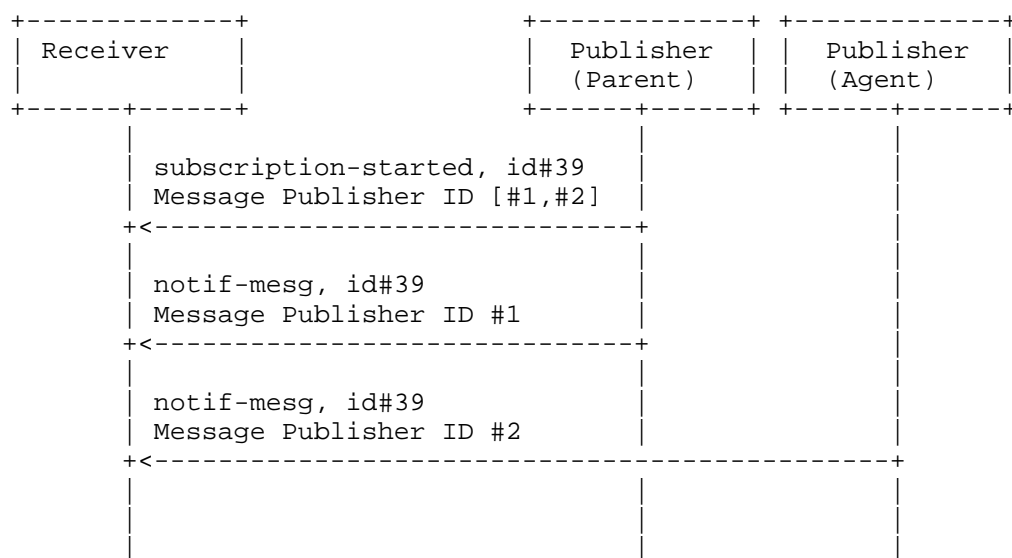


Figure 3: Call Flow for Configured Subscription

Before starting to push data, the "subscription-started" subscription state notification is sent to the Receiver. The following example assumes the NETCONF transport has already established. The notification indicates that the configured subscription is decomposed into two component subscriptions which will be published by two message Message Publisher IDs: #1 and #2.

```
<notification xmlns="urn:ietf:params:xml:ns:netconf:notification:1.0">
  <eventTime>2007-09-01T10:00:00Z</eventTime>
  <subscription-started
    xmlns="urn:ietf:params:xml:ns:yang:ietf-subscribed-notifications"
    xmlns:yp="urn:ietf:params:xml:ns:yang:ietf-yang-push">
    <identifier>39</identifier>
    <yp:datastore
      xmlns:ds="urn:ietf:params:xml:ns:yang:ietf-datastores">
      ds:operational
    </yp:datastore>
    <yp:datastore-xpath-filter
      xmlns:ex="https://example.com/sample-data/1.0">
      /ex:foo
    </yp:datastore-xpath-filter>
    <yp:periodic>
      <yp:period>250</yp:period>
    </yp:periodic>
    <message-publisher-id
      xmlns="urn:ietf:params:xml:ns:yang:ietf-distributed-notif">
      1
    </message-publisher-id>
    <message-publisher-id
      xmlns="urn:ietf:params:xml:ns:yang:ietf-distributed-notif">
      2
    </message-publisher-id>
  </subscription-started>
</notification>
```

Figure 4: "subscription-started" Subscription State Notification

Then, both Publishers send notifications with the corresponding data record to the Receiver.

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