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RFC 9984

YANG Groupings for UDP Clients and UDP Servers

Abstract

This document presents two YANG 1.1 modules with reusable groupings for managing UDP clients and UDP servers.

Status of This Memo

This is an Internet Standards Track document.

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1. Introduction

This document presents two YANG 1.1 [[RFC7950](#)] modules with reusable groupings for managing UDP clients and UDP servers [[RFC768](#)]. These modules may be used directly (e.g., define a specific UDP client or UDP server) or in conjunction with the configuration defined for higher-level protocols that depend on UDP.

1.1. 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.

1.2. Adherence to the NMDA

This document is compliant with the Network Management Datastore Architecture (NMDA) [RFC8342]. It does not define any protocol-accessible nodes that are "config false".

1.3. Conventions

Various examples in this document use the XML [W3C.REC-xml-20081126] encoding. Other encodings, such as JSON [RFC8259], could alternatively be used.

2. The "ietf-udp-client" Module

This section defines a YANG 1.1 module called "ietf-udp-client". This YANG module defines the "udp-client" grouping for providing UDP clients with remote server information.

[Section 2.1](#) provides the overview of the YANG module. An example of usage is illustrated in [Section 2.2](#). [Section 2.3](#) defines the YANG module itself.

2.1. Data Model Overview

This section provides an overview of the features and the grouping defined in the "ietf-udp-client" YANG module.

2.1.1. Features

The "ietf-udp-client" module defines the following "feature" statement:

```
Features:  
+-- local-binding
```

The diagram above uses syntax that is similar to the syntax used in [RFC8340]; but the syntax from the diagram is not defined in [RFC8340].

This feature indicates that the client supports configuring local bindings (i.e., the local address and local port number) for UDP clients.

2.1.2. The "udp-client" Grouping

The following tree diagram [RFC8340] illustrates the tree structure of the "udp-client" grouping:

```
module: ietf-udp-client

  grouping udp-client:
    +-- remote-address      inet:host
    +-- remote-port?       inet:port-number
    +-- local-address?     inet:ip-address {local-binding}?
    +-- local-port?       inet:port-number {local-binding}?
```

The description of these parameters is provided below:

- The "remote-address", which is mandatory, may be configured as an IPv4 address, an IPv6 address, or a hostname. The resolved address should be compatible with the local address family, if also provided.
- The "remote-port" is defined with neither a "default" nor a "mandatory" statement. YANG modules using this grouping **SHOULD** refine the grouping with a "default" statement when the port number is well-known (e.g., a port number allocated by IANA) or with a "mandatory" statement if a port number needs to always be configured. This **MAY** be ignored when the port number is neither well-known nor mandatory to configure, such as might be the case when this grouping is used by another grouping.
- The "local-address", which is enabled by the "local-binding" feature, may be configured as an IPv4 address, an IPv6 address, or a wildcard value. In normal operation, the local and configured remote addresses **SHOULD** be from the same address family. Differences between address families may occur in abnormal or error conditions; therefore, they are allowed to be reported.
- The "local-port", which depends on the "local-binding" feature, is not mandatory. Its default value is "0", indicating that the operating system can select an arbitrary port number.

2.2. Example Usage

This section presents an example of usage of the "udp-client" grouping.

```
<!-- The outermost element below doesn't exist in the data model. -->
<!-- It simulates if the "grouping" were a "container" instead. -->

<udp-client xmlns="urn:ietf:params:xml:ns:yang:ietf-udp-client">
  <remote-address>www.example.com</remote-address>
  <remote-port>10000</remote-port>
  <local-address>192.0.2.2</local-address>
  <local-port>12345</local-port>
</udp-client>
```

2.3. YANG Module

This module imports types defined in [\[RFC9911\]](#).

```
<CODE BEGINS> file "ietf-udp-client@2026-06-15.yang"
```

```
module ietf-udp-client {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-udp-client";
  prefix udpc;

  import ietf-inet-types {
    prefix inet;
    reference
      "RFC 9911: Common YANG Data Types";
  }

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

    Authors: Alex Huang Feng
             <mailto:alex.huang-feng@insa-lyon.fr>
             Pierre Francois
             <mailto:pierre.francois@insa-lyon.fr>";
  description
    "Defines a generic grouping for UDP-based client applications.

    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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    Relating to IETF Documents
    (https://trustee.ietf.org/license-info).

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

    This version of this YANG module is part of RFC 9984; see
    the RFC itself for full legal notices.";

  revision 2026-06-15 {
    description
      "Initial revision";
    reference
      "RFC 9984: YANG Groupings for UDP Clients and UDP Servers";
  }

  feature local-binding {
    description
      "Indicates that the UDP client supports configuring local
      bindings (i.e., the local address and local port number)
```

```
    for UDP clients.";
}

grouping udp-client {
  description
    "A reusable grouping for UDP clients.

    Note that this grouping uses fairly typical descendant
    node names such that a stack of 'uses' statements will
    have name conflicts. It is intended that the consuming
    data model will resolve the issue (e.g., by wrapping
    the 'uses' statement in a container called
    'udp-client-parameters'). This module purposely does
    not do this itself so as to provide maximum flexibility
    to consuming models.";
  leaf remote-address {
    type inet:host;
    mandatory true;
    description
      "The IP address or hostname of the remote UDP server.";
  }
  leaf remote-port {
    type inet:port-number;
    description
      "The port number of the remote UDP server.";
  }
  leaf local-address {
    if-feature "local-binding";
    type inet:ip-address;
    description
      "The local IP address to bind to when sending UDP
      datagrams to the remote server. INADDR_ANY ('0.0.0.0') or
      INADDR6_ANY ('0:0:0:0:0:0:0:0' a.k.a. ':::') may be used
      so that the client can bind to any IPv4 or IPv6 address.
      In normal operation, the local and configured
      remote addresses SHOULD be from the same address family.
      Differences between address families may occur in
      abnormal or error conditions; therefore, they are allowed to
      be reported.";
  }

  leaf local-port {
    if-feature "local-binding";
    type inet:port-number;
    default "0";
    description
      "The local port number to bind to when sending UDP
      datagrams to the remote server. The port number '0',
      which is the default value, indicates that any available
      local port number may be used.";
  }
}
}
}

<CODE ENDS>
```

3. The "ietf-udp-server" Module

This section defines a YANG 1.1 module called "ietf-udp-server". This YANG module defines the "udp-server" grouping for managing UDP servers.

[Section 3.1](#) provides an overview of the "ietf-udp-server" YANG module. An example of usage is illustrated in [Section 3.2](#). [Section 3.3](#) defines the YANG module itself.

3.1. Data Model Overview

This section provides an overview of the grouping defined in the "ietf-udp-server" module.

3.1.1. The "udp-server" Grouping

The following tree diagram [[RFC8340](#)] illustrates the tree structure of "udp-server" grouping:

```
module: ietf-udp-server
  grouping udp-server:
    +-- local-bind* [local-address]
       +-- local-address    inet:ip-address
       +-- local-port?     inet:port-number
```

The description of these parameters is provided below:

- The "local-address", which is mandatory, may be configured as an IPv4 address, an IPv6 address, or a wildcard value.
- The "local-port" is defined with neither a "default" nor a "mandatory" statement. YANG modules using this grouping **SHOULD** refine the grouping with a "default" statement when the port number is well-known (e.g., a port number allocated by IANA) or with a "mandatory" statement if a port number needs to always be configured. This **MAY** be ignored when the port number is neither well-known nor mandatory to configure, such as might be the case when this grouping is used by another grouping.

3.2. Example Usage

This section presents two examples of usage of the "udp-server" grouping.

The following shows an example of a server configured for listening to an IPv4 address:

```

<!-- The outermost element below doesn't exist in the data model. -->
<!-- It simulates if the "grouping" were a "container" instead. -->

<udp-server xmlns="urn:ietf:params:xml:ns:yang:ietf-udp-server">
  <local-bind>
    <local-address>192.0.2.2</local-address>
    <local-port>49152</local-port>
  </local-bind>
</udp-server>

```

The following shows an example of a server configured for listening to an IPv4 and IPv6 together:

```

<!-- The outermost element below doesn't exist in the data model. -->
<!-- It simulates if the "grouping" were a "container" instead. -->

<udp-server xmlns="urn:ietf:params:xml:ns:yang:ietf-udp-server">
  <local-bind>
    <local-address>192.0.2.2</local-address>
    <local-port>49152</local-port>
  </local-bind>
  <local-bind>
    <local-address>2001:db8::0</local-address>
    <local-port>49153</local-port>
  </local-bind>
</udp-server>

```

3.3. YANG Module

This module imports types defined in [\[RFC9911\]](#).

```

<CODE BEGINS> file "ietf-udp-server@2026-06-15.yang"

module ietf-udp-server {
  yang-version 1.1;
  namespace "urn:ietf:params:xml:ns:yang:ietf-udp-server";
  prefix udps;

  import ietf-inet-types {
    prefix inet;
    reference
      "RFC 9911: Common YANG Data Types";
  }

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

    Authors: Alex Huang Feng
             <mailto:alex.huang-feng@insa-lyon.fr>

```

```

        Pierre Francois
        <mailto:pierre.francois@insa-lyon.fr>;
description
  "Defines a generic grouping for UDP-based server applications.

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  authors of the code. All rights reserved.

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  (https://trustee.ietf.org/license-info).

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

  This version of this YANG module is part of RFC 9984; see
  the RFC itself for full legal notices.";
revision 2026-06-15 {
  description
    "Initial revision";
  reference
    "RFC 9984: YANG Groupings for UDP Clients and UDP Servers";
}
grouping udp-server {
  description
    "A reusable grouping for managing UDP servers.

    Note that this grouping uses fairly typical descendant
    node names such that a stack of 'uses' statements will
    have name conflicts. It is intended that the consuming
    data model will resolve the issue (e.g., by wrapping
    the 'uses' statement in a container called
    'udp-server-parameters'). This module purposely does
    not do this itself so as to provide maximum flexibility
    to consuming models.";
  list local-bind {
    key "local-address";
    min-elements 1;
    description
      "A list of bind (listen) points for this server
      instance. A server instance may have multiple
      bind points to support, e.g., the same port number in
      different address families or different port numbers
      in the same address family.";
    leaf local-address {
      type inet:ip-address;
      mandatory true;
      description
        "The local IP address to listen on for incoming
        UDP datagrams. INADDR_ANY ('0.0.0.0') or
        INADDR6_ANY ('0:0:0:0:0:0:0:0' a.k.a. ':::') may be used
        so that the server can listen to any IPv4 or IPv6

```


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

URI: urn:ietf:params:xml:ns:yang:ietf-udp-server

Registrant Contact: The IESG.

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

5.2. The "YANG Module Names" Registry

IANA has registered the following YANG modules in the ["YANG Module Names" registry \[RFC6020\]](#) within the "YANG Parameters" registry group:

Name: ietf-udp-client

Maintained by IANA? N

Namespace: urn:ietf:params:xml:ns:yang:ietf-udp-client

Prefix: udpc

Reference: RFC 9984

Name: ietf-udp-server

Maintained by IANA? N

Namespace: urn:ietf:params:xml:ns:yang:ietf-udp-server

Prefix: udps

Reference: RFC 9984

6. References

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