IEEE 1914 NGFI

IEEE 1914.3a RoE – UDP Port Number Application

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Teleconference

Application for Registered UDP Port Number

- The proposed answers to the IANA UDP Port Number Application are shown in this presentation
- For application rules, see RFC 6335 – Internet Assigned Numbers Authority (IANA) Procedure for the Management of the Service name and Transport Protocol Port Number Register
- Existing assignments can be found at https://www.iana.org/assignments/service-names-port-numbers/service-names-port-numbers.txt

Background - Service Name (from RFC 6335)

5.1. Service Name Syntax

Valid service names are hereby normatively defined as follows:

- MUST be at least 1 character and no more than 15 characters long
- MUST contain only US-ASCII [ANSI.X3.4-1986] letters 'A' - 'Z' and 'a' - 'z', digits '0' - '9', and hyphens ('-', ASCII 0x2D or decimal 45)
- MUST contain at least one letter ('A' - 'Z' or 'a' - 'z')
- MUST NOT begin or end with a hyphen
- hyphens MUST NOT be adjacent to other hyphens

The reason for requiring at least one letter is to avoid service names like "23" (could be confused with a numeric port) or "6000-6063" (could be confused with a numeric port range). Although service names may contain both upper-case and lower-case letters, case is ignored for comparison purposes, so both "http" and "HTTP" denote the same service.

Background - Description, Reference (from RFC 6335)

- Description: A short description of the service associated with the assignment request is REQUIRED. It should avoid all but the most well-known acronyms.

- Reference: A description of (or a reference to a document describing) the protocol or application using this port. This is REQUIRED. The description must state whether the protocol uses IP-layer broadcast, multicast, or anycast communication.

  For assignments requesting only a Service Name, or a Service Name and User Port, a statement that the protocol is proprietary and not publicly documented is also acceptable, provided that the required information regarding the use of IP broadcast, multicast, or anycast is given.

  For any assignment request that includes a User Port, the assignment request MUST explain why a port number in the Dynamic Ports range (discovered by clients dynamically at run-time) is unsuitable for the given application.

  For any assignment request that includes a System Port, the assignment request MUST explain why a port number in the User Ports or Dynamic Ports ranges is unsuitable, and a reference to a stable protocol specification document MUST be provided.

  IANA MAY accept early assignment [RFC4020] requests (known as "early allocation" therein) from IETF working groups that reference a sufficiently stable Internet-Draft instead of a published Standards-Track RFC.

Resource Request - 1

Assignee

List the organization, company or individual person responsible for the initial assignment. If you are registering this on behalf of a company or organization, the company/organization name would go here.

Assignee Name
Required
IEEE1914-3

Assignee E-mail
Required
Richard.Tse@microchip.com

Contact Person

The responsible person for the Internet community to send questions to. This person is also authorized to submit changes on behalf of the Assignee. In cases of conflict between the Assignee and the Contact, the Assignee decisions take precedence.

Contact Name
Required
Richard Tse

Contact E-mail
Required
Richard.Tse@microchip.com

Resource request

Resources required
Required
- (●) Port number and service name
- ( ) Service name only

Transport Protocols
Required
- [ ] TCP
- [x] UDP
- [ ] SCTP
- [ ] DCCP

Service Code

Required if DCCP is requested; leave blank otherwise. See RFC 6335 section 10.3.

Resource Request - 2

Service Name
Required

RoE

(REQUIRED, 15 character maximum) See RFC 6335 section 5.1

Desired Port Number

Leave blank if no preference

Note: It is inappropriate to use a port number until your application has been approved for assignment.

Description
Required

Radio over Ethernet

See RFC 6335 section 8.1.1

Reference
Required

IEEE 1914.3a defines the encapsulation and mapping of radio protocols transported over Ethernet frames and Internet Protocol (IP) packets, and the operation of the mappers and de-mappers. Structure-agnostic definitions are provided for any digitized radio data. Structure-aware

Please provide a brief and basic technical description of the protocol that will use the service name or port number, including message formats, types, sequences, functionalities, of your protocol. In addition, please address the specific questions included below to the extent possible.

Defined TXT keys

The list of defined TXT record keys for this service or URL reference to document describing defined keys (see RFC 6763, Section 6). Required for service names only.

Resource Request - expanded

Reference:

- IEEE Std 1914.3a (RoE) defines the encapsulation and mapping of radio protocols transported over Ethernet frames and Internet Protocol packets and the operation of its mappers and de-mappers.
  The RoE protocol is not expected to use broadcast, unicast, or anycast.
  The reasons why RoE needs a registered UDP port number are explained in the Usage Questions below.

Usage Questions - 1

Usage Questions

Usage Questions

If broadcast/multicast is used, how and what for?

```
Broadcast/multicast is not expected to be used.
```

If UDP is requested, please explain how traffic is limited, and whether the protocol reacts to congestion.

```
The maximum traffic load for each RoE connection is limited by the
bandwidth of the radio antenna(s). RoE packets are expected to be
```

If UDP is requested, please indicate whether the service is solely for the discovery of hosts supporting this protocol.

```
The UDP service is not for the discovery of hosts supporting this
protocol.
```

Please explain how your protocol supports versioning.

```
The same registered UDP port number would be used for all versions of
the IEEE 1914.3 protocol. Each of RoE's message types, including ones
```

If your request is for more than one transport, please explain in detail how the protocol differs over each transport.

```
Only UDP transport is requested.
```

Please describe how your protocol supports security. Note that new services are expected to support security capabilities and to avoid insecure variants.

```
The RoE protocol does not deal with security.  Security, if required,
is expected to be dealt with at the Ethernet layer (MACSec) or the IP
```

Usage Questions - 2

Please explain why a unique port assignment is necessary as opposed to a port in range (49152-65535) or existing port.

A unique UDP port assignment is necessary because:
a). Each RoE connection is semi-permanent and occupies the UDP port number indefinitely

Please explain the state of development of your protocol.

The IEEE 1914.3a standard is expected to go through IEEE sponsor balloting in the summer of 2021 and to be submitted to IEEE SA for

If SCTP is requested, is there an existing TCP and/or UDP service name or port number assignment? If yes, provide the existing service name and port number.

SCTP is not requested

What specific SCTP capability is used by the application such that a user who has the choice of both TCP (and/or UDP) and SCTP ports for this application would choose SCTP? See RFC 4960 section 7.1.

SCTP is not used

Please provide any other information that would be helpful in understanding how this protocol differs from existing assigned services.

RoE defines unique standardized methods to carry various types of radio data over packets.
RoE cannot change an already assigned UDP port number with another IEEE

By submitting my personal data, I agree that my personal data will be processed in accordance with our Privacy Policy and agree to abide by the website Terms of Service.

Lodge request

Usage Questions - expanded

If UDP is requested, please explain how traffic is limited, and whether the protocol reacts to congestion.

- The maximum traffic load for each RoE connection is limited by the bandwidth of the corresponding radio antenna(s). RoE packets are expected to be prioritized appropriately using Ethernet VLAN, IPv4 DSCP, and/or IPv6 Traffic Class. The RoE protocol defines mechanisms for detecting lost and late packets as well as replacement data patterns to take the place of the payload in lost packets.

Usage Questions - expanded

If UDP is requested, please indicate whether the service is solely for the discovery of hosts supporting this protocol.

- The UDP service is not for the discovery of hosts supporting this protocol.

Usage Questions - expanded

Please explain how your protocol supports versioning.

- The same UDP port number would be used for all versions of the IEEE 1914.3 protocol. Each of RoE's message types, including ones that might be defined in the future, can be identified by the protocol's subType field.

Usage Questions - expanded

Please describe how your protocol supports security. Note that new services are expected to support security capabilities and to avoid insecure variants.

- The RoE protocol relies on security as provided by appropriate mechanisms such as MACSec at the Ethernet layer and/or IPSec at the IP layer.

Usage Questions - expanded

Please explain why a unique port assignment is necessary as opposed to a port in range (49152-65535) or existing port.

- A unique UDP port assignment is necessary because:
  a) Each RoE connection is semi-permanent and occupies the UDP port number indefinitely.
  b) The management capabilities are very light at radios that are serviced by RoE. They would not typically have the look-up services required to get a dynamic port number.
  c) RoE packets need to be accurately timestamped (with nanosecond accuracy) when they arrive at their destination. Timestamping with this accuracy requires hardware identification of RoE packets. Because a single IP address could terminate up to 256 RoE endpoints (identified by the RoE flowID field), a single UDP port number would allow the hardware classification logic to operate fast enough to identify all RoE packets for timestamping. If every IP address had a corresponding 256 dynamically assigned UDP port numbers, a hardware timestamping implementation would become infeasible.
  d) An RoE connection could span across multiple network domains that are serviced by different operators. This prevents any coordinated assignment of dynamic UDP port numbers.

Usage Questions - expanded

Please explain the state of development of your protocol.

- The IEEE 1914.3a standard is expected to go through IEEE sponsor balloting in the summer of 2021 and to be submitted to IEEE SA for approval at the end of 2021.

Usage Questions - expanded

Please provide any other information that would be helpful in understanding how this protocol differs from existing assigned services.

- RoE defines unique standardized methods to carry various types of radio data over packets.
- RoE cannot share an already-assigned UDP port number with any existing IEEE protocol because it does not have an unique identifier that could separate it from any other IEEE protocol.