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DLEP Radio Channel Utilization Extension

Abstract

This document defines an extension to the Dynamic Link Exchange Protocol (DLEP) to provide the utilization of a radio channel.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on 5 August 2021.

Table of Contents

1. Introduction

The dynamic Link Exchange Protocol (DLEP) is defined in [RFC8175]. It provides the exchange of link-related control information between DLEP peers. DLEP peers are comprised of a modem and a router. DLEP defines a base set of mechanisms as well as support for possible extensions. This document defines one such extension.

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

2. Extension Usage and Identification

The use of the Channel Utilization Extension SHOULD be configurable. To indicate that the Channel Utilization Extension is to be used, an implementation MUST include the Radio Channel Active and Radio Channel Busy Value in the Extensions Supported Data Item. The Extensions Supported Data Item is sent and processed according to [RFC8175].

The Radio Band Extension Type Value is TBD; see Section TBD.

3. Radio Channel Active Data Item

Radio Channel Active Item is mandatory and contains information how long the radio channel has been active. This value is usually interface specific.

The value in this item must be larger than the values in the other three Data Items this extensions define together.

The format of the Radio Channel Active Data Item is:

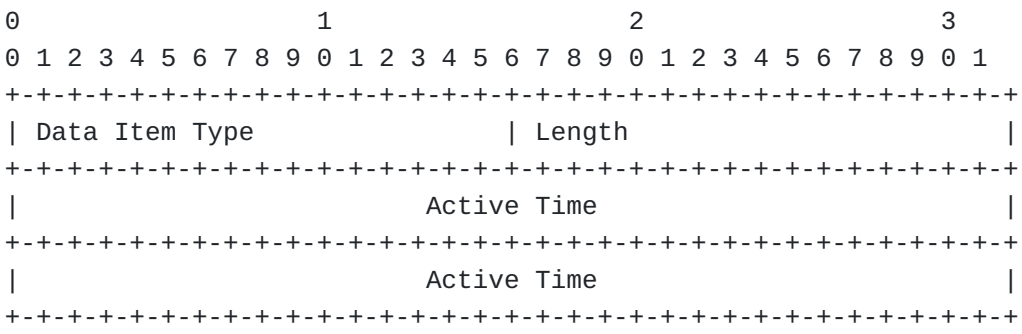

Figure 1

Data Item Type: TBD

Length: 8

Active Time: Time in nanoseconds since the channel has been active.

4. Radio Channel Busy Data Item

Radio Channel Busy Item is mandatory and contains information how much time the radio channel has been busy but has not been, not including the time in the Channel Rx and Chanel Tx Data Item. This value is usually interface specific.

The value in the Channel Active item must be larger than the values in the other three Data Items this extensions define together.

The format of the Radio Channel Busy Data Item is:

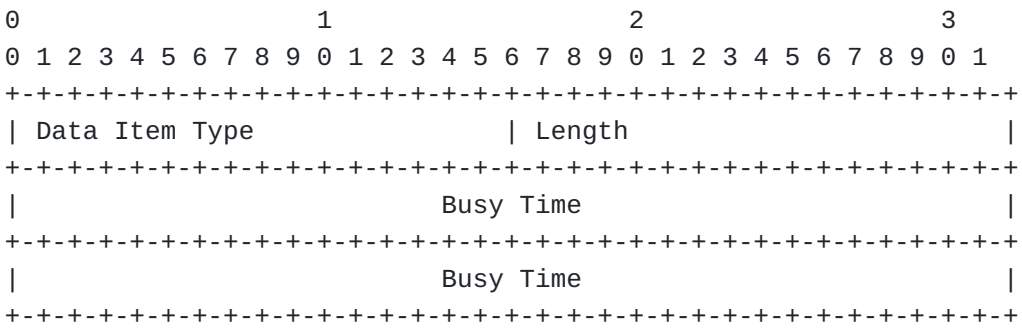

Figure 2

Data Item Type: TBD

Length: 8

Busy Time: Time in nanoseconds the channel was busy during its active time.

5. Radio Channel Rx Data Item

Radio Channel Rx Item is optional and contains information how much time the local radio has been receiving data from other radios. This value is usually interface specific.

The value in the Channel Active item must be larger than the values in the other three Data Items this extensions define together.

The format of the Radio Channel Rx Data Item is:

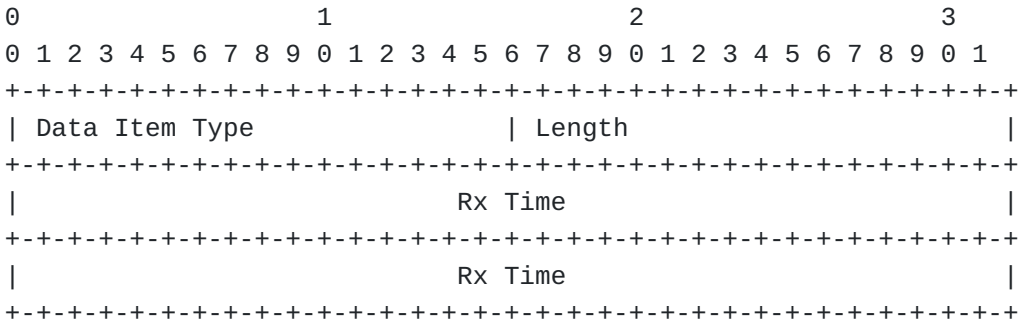

Figure 3

Data Item Type: TBD

Length: 8

Rx Time: Time in nanoseconds the local radio was receiving data from other radios during its active time.

6. Radio Channel Tx Data Item

Radio Channel Tx Item is optional and contains information how much time the local radio has been transmitting data to other radios. This value is usually interface specific.

The value in the Channel Active item must be larger than the values in the other three Data Items this extensions define together.

The format of the Radio Channel Tx Data Item is:

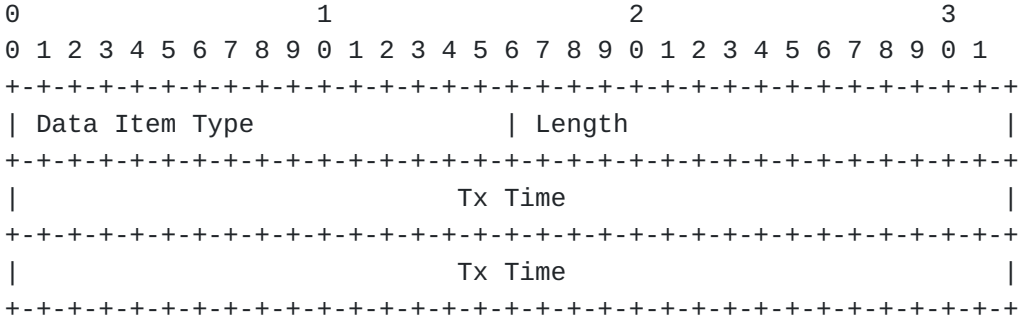

Figure 4

Data Item Type: TBD

Length: 8

Tx Time: Time in nanoseconds the local radio was transmitting data to other radios during its active time.

7. Security Considerations

The extension introduces a new Data Item for DLEP. The extension does not inherently introduce any additional vulnerabilities above those documented in [RFC8175]. The approach taken to security in that document applies equally when running the extension defined in this document.

8. IANA Considerations

As described below, IANA has assigned two values per this document. Both assignments are to registries defined by [RFC8175].

8.1. Extension Type Value

IANA has assigned the following value in the "Extension Type Values" registry within the "Dynamic Link Exchange Protocol (DLEP) Parameters" registry. The new value is in the range with the "Specification Required" [RFC8126] policy:

Code	Description
TBD	Radio Channel Utilization

Table 1: New Extension Type Value

8.2. Data Item Value

IANA has assigned the following value in the "Data Item Type Values" registry within the "Dynamic Link Exchange Protocol (DLEP) Parameters" registry. The new value is in the range with the "Specification Required" [RFC8126] policy:

Type Code	Description
TBD	Radio Channel Active
TBD	Radio Channel busy
TBD	Radio Channel Rx
TBD	Radio Channel Tx

Table 2: New Data Item Value

9. 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>.

[RFC8175] Ratliff, S., Jury, S., Satterwhite, D., Taylor, R., and B. Berry, "Dynamic Link Exchange Protocol (DLEP)", RFC 8175, DOI 10.17487/RFC8175, June 2017, <https://www.rfc-editor.org/info/rfc8175>.

10. Informative References

[RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <https://www.rfc-editor.org/info/rfc8126>.

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