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DLEP Radio Band Extension  
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## Abstract

This document defines an extension to the Dynamic Link Exchange Protocol (DLEP) to provide the frequency bands used by the radio.

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## 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 Radio Band Extension SHOULD be configurable. To indicate that the Radio Band Extension is to be used, an implementation MUST include the Radio Band Extension Type 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 described in Section 5.1.

## 3. Radio Band Data Item

Radio Band Data Item contains information which radio frequency resources are being used. These values are usually interface specific and static during the DLEP session.

The Radio Band Data Item can be used multiple times to represent multiple radio bands.

The Item can be used in a neighbor specific message if the radio use dedicated subcarriers to talk to neighbors.

Frequency selection is often controlled by the radio configuration. By giving the radio a standardized way to transmit its selected frequency configuration the router can aggregate multiple radios settings into a common information page, can do some basic checking for configuration mistakes by comparing known radio group configuration with their frequency by radio (if the routers have a second communication channel) or forward the data to an upper layer for visualization.

The information in this Item gives the router an easy way to calculate the spectral efficiency of a radio link, how much bandwidth is used for the current data-rate reported by DLEP. This can be integrated into the routing metric to focus traffic on links that use the spectrum efficiently.

The Item can also be used as an interface to a cognitive radio controller on the router, analyzing the correlation of transmission disruptions with the frequency bands and could (together with the Request Link Characteristics message) be used to change the frequency of the radio in a standardized way.

Both values in the TLV (Carrier Frequency and Bandwidth) are 64 bit unsigned integers.

The format of the Radio Band Data Item is:

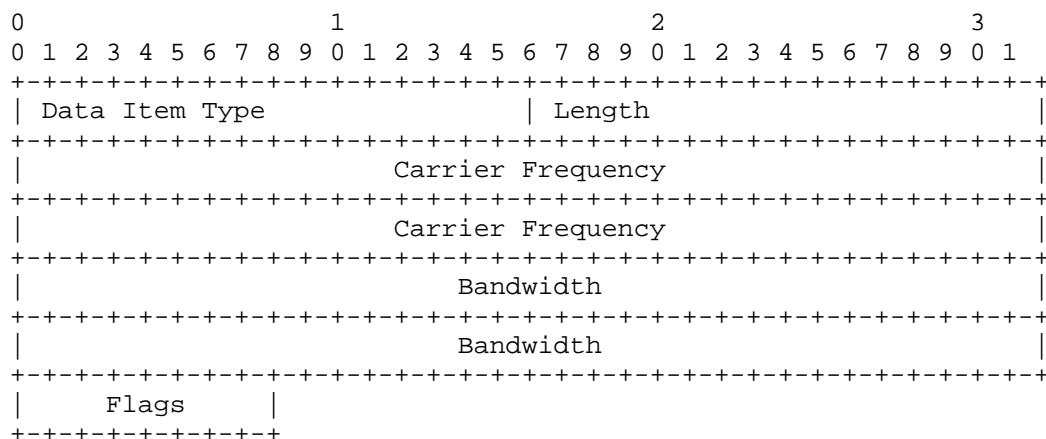


Figure 1

Data Item Type: TBD1

Length: 17

Center Frequency: The center frequency of the band in Hz.

Bandwidth: The bandwidth of the band in Hz.

Flags: Flags field as defined below.

The Flags field is defined as:

```

0 1 2 3 4 5 6 7
+---+---+---+---+---+
| Reserved |U|D|
+---+---+---+---+---+

```

Figure 2

U: Uplink Flag, indicating the band is used for transmitting data.

D: Downlink Flag, indicating the band is used for receiving data.

Reserved: MUST be zero. Left for future assignment.

#### 4. 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.

#### 5. IANA Considerations

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

##### 5.1. 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
TBD2	Radio Band

Table 1: New Extension  
Type Value

## 5.2. 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
TBD1	Radio Band

Table 2: New Data Item  
Value

## 6. 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>>.

## 7. 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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