DSR Extensions for Network Coding Capability
draft-ahn-manet-networkcoding-dsr-00.txt

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Abstract

   This document describes how DSR [1] can be extended for the support
   of network coding capability in the MANET. Because the network coding
   capability increases the wireless network capacity, in this draft,
   we describe how we can extend DSR for the support of the network
   coding capability.

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1. Requirements notation

   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].
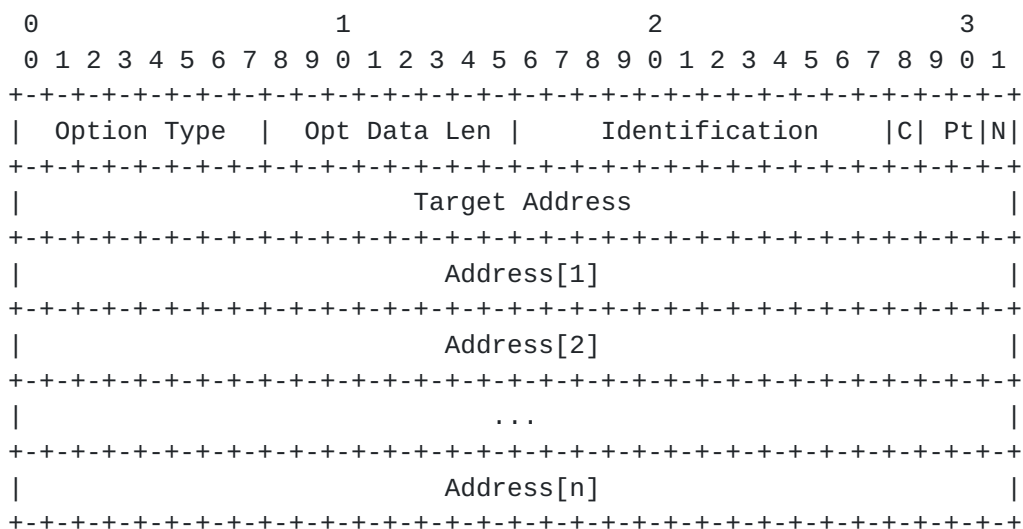
2. Introduction

   The mobile ad hoc network (MANET) is composed of a number of mobile
   nodes which can communicate with each other through multiple
   wireless links without the help of a wired infrastructure.
   Because a wireless link is more restricted in its capacity than a
   wired link, the efficient utilization of wireless links is one of
   the important issues in wireless networs, especially in the MANET.

   The network coding is one of the mechanisms that can increase
   wireless network capacity [1]. In this draft, we describe
   how the DSR Options header has to be extended to support
   the network coding capability.

3. Extensions on DSR Options Header

3.1 Extensions on DSR Route Request Option

   The Route Request option in the DSR Options header is extended as
   follows:

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Option Type  | Opt Data Len |     Identification   |C| Pt|N|
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                        Target Address                         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                         Address[1]                            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                         Address[2]                            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                           ...                                 |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                         Address[n]                            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

IP fields: the same as described in [2]

Route Request fields: the same as described in [3] except for the
                      N bit

   N
      The Network Coding bit to indicate whether a MANET node can be
      involved in the network coding activities or not. If N bit is 1,
      the nodes belonging to the source-to-destination route have to
      turn on the network coding capability. The default value of
      the N bit is 0.

[4]. Other Considerations

   TBD.

References

   [1] M. Tarique, K. E. Tepe, S. Abidi and S. Erfani, "Survey of
       Multipath Routing Protocols for Mobile Ad Hoc Networks," Journal
       of Network and Computer Applications, November 2009.
   [2] D. Johnson, Y. Hu and D. Maltz, "The Dynamic Source Routing
       Protocol," RFC 4728, February 2007.
   [3] S. Ahn, "DSR Extensions for Multipath Routing,"
       IETF draft-ahn-manet-multipath-dsr-00.txt, December 2015.

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