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Abstract

This document describes the requirements on providing the network coding capability in the mobile ad hoc network (MANET). For this, the conditions to be considered in providing the network coding capability in the MANET are listed.

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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 networks, especially in the MANET.

The network coding is one of the mechanisms that can increase wireless network capacity [1]. In order to provide the network coding capability in the MANET, there are many things to be considered.

In this draft, we define the requirements on supporting the network coding in the MANET.

3. Requirements on the Provision of Network Coding

In applying the network coding capability to the MANET, the following considerations have to be accompanied with:

- the delay incurred by waiting at nodes to increase the possibility of encodings in a source-to-destination route
- the number of encodings and decodings experienced by a packet in a source-to-destination route
- the throughput perceived at destinations
- the base MANET unicast routing protocol, such as AODV [2] or DSR [3], on which the network coding capability is applied
- the degree of changes on the base MANET unicast routing protocol

With considering the above-mentioned conditions, the provision of the network coding capability in the MANET SHOULD satisfy the following requirements:

- The delay incurred by the network coding capability SHOULD be controlled such that it does not exceed a certain amount
- The number of encodings and decodings SHOULD NOT exceed a given threshold
- The modifications and/or extensions on the base MANET unicast routing protocol SHOULD NOT hinder the operation of the base MANET unicast routing protocol.

4. Other Considerations

TBD

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