Fundamentals of QMP

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***Abstract*—This paper talks about the very basic aspects of QMP (Quick Mesh Project), which is the firmware used by the Mobile Node.**

I. Introduction

When we talk about QMP we are referring to an operating system (firmware) used for embedded devices. The two main advantages that it provides are:

- A simple way to deploy Mesh (or Manet) networks.
- A quick and easy way to expand an Internet uplink to end users.

QMP has been developed focusing mainly in two scenarios: To achieve quick deployments and to be used in wireless network communities.

II. Quick Deployments

Quick deployments are those who achieve the following requirements:

- The deployment must be performed as fast as possible.
- It must be able to be done by non-technical people.
- It must be possible in most situations.

As mentioned before, QMP accomplish those requirements and to do so it uses some technologies:

- A mobile ad-hoc network (MANET) with dynamic routing protocol.
- An out-of-the-box system, where each node configures itself automatically.
- 802.11 (WiFi) technologies, so no cables or any other infrastructure is needed.

III. Dynamic Routing Protocol (DRP)

There are many different DRP with a wide range of features and options. The QMP team, after an extensive study decided to choose these protocols:

- BMX6 as the main DRP.
- OLSR6 as a backup DRP.
- Babel as a backup DRP but optional.

IV. BMX6

The two main features of this DRP are:

1) Pro-active: It maintains an updated routing table by periodically distributing information through the network. Thus it can be considered loop-free.

2) Destination-sequenced, Distance-vector (DSDV): Table-driven routing scheme where the node does not know the entire network topology, just the best neighbor for a specific destination.

BMX6 Uses OriGinator Messages (OGM) to update routes ad metrics in the network. Those packets are sent every half second using UDP to the direct connected neighbors. Those neighbors forward the packet to its own neighbors and so all the nodes know the changes in the mesh. The following figure shows an example of this:

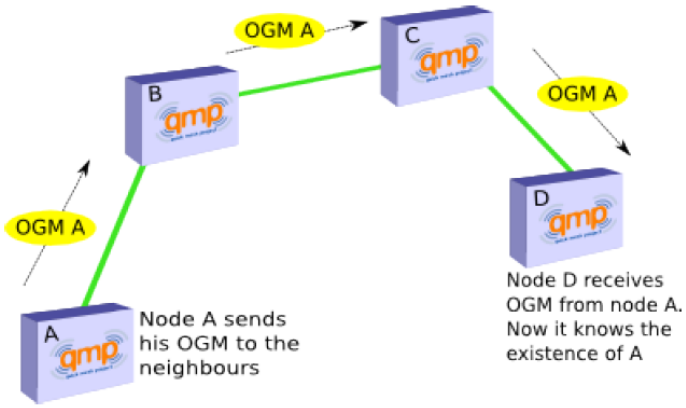

Fig. 1

The kind of packets used by BMX6 are these:

Frame name	Description
HELLO ADV	Hello advertisement. Used for letting neighboring nodes detect the link quality in transmit direction (from sending to receiving node).
RP ADV	Rx probe advertisement. Used for reporting about reception rate of hello messages from neighboring nodes.
OGM ADV	OGM advertisement. Used for updating periodically route and metric information over the mesh.
OGM ACK	OGM acknowledgement. Used for acknowledging the previously reception of a full OGM ADV frame.

V. Information sources

Most of the information contained in this document has been extracted from qmp.cat and Pau Escrich's PCF: "*Quick deployment network using MANET*"