OLPC:Mesh Project definition

OLPC:Mesh Traffic control in mesh networks

Intro

Nowadays mobile and ultramobile devices able to maintain a wireless connection with each other and to form a **client** mesh network are becoming more and more spred. The basic problem lies in optimal bandwidth sharing between a management traffic and a user one. On one hand it is necessary to provide effective routing and quick reaction on unit porting/disconnection, on the other hand a high-level service (QoS) of payload data transfer is extremely important too.

Environments

Only *client* mesh networks without any infrastructure elements such as servers, hubs, access points etc are being considered. That leads to more strict requirements for bandwidth sharing algorithms. They are:

- extra management traffic for synchronization of topology information between all net nodes,
- management data reservation,
- distributed control procedures usage.

The majority of modern IP-routing algorithms are directed to **infrastructure** networks what causes a number of essential deficiencies in their use for mesh networks. The disadvantages are:

- unefficiency of management traffic limitation algorithms in dynamic networks (dynamic both by their topology and data flows structure),
- primitivity of topology changing algorithms for load balancing in Ad Hoc networks,
- absence of formal mesh networks behaviour models and therefore predominance of empiric network management rules above algoritmic ones.

Research directions

Mesh network infrastructure model development

One of research directions is an adequate mesh networks model development which would take into account the particular qualities of modern wireless devices and ways of their usage (content exchange, teleconferences, games etc). In the context of model development it is intended to observe current states of algorithms, standards and routing protocols realizations for Ad Hoc and Mesh networks. The model should include:

- QoS control,
- dynamic topology reconfiguration,
- management traffic volume control,
- load balancing.

Routing algorithm development

Mesh network infrastructure model is intended to help in developing of a routing/controlling algoritm for client mesh network that would provide adaptive bandwidth sharing between management and user traffic with considering of network topology and the way of its usage.

Open source realization

In the context of this project open source realization development is destined for XO laptops (OLPC, http://laptop.org) and its testing is proposed to take place in study rooms with such laptops.

Project stages

- Problem description and task defining - spring 2008
- Model development and its investigation - autumn 2008
- Routing algorithm development - winter 2008/2009
- XO module development - spring 2009
- Module testing in study rooms - spring-autumn 2009
- RFC development - winter 2009/2010

Short-term project goals

Long-term project goals ()

Useful links

- http://wiki.laptop.org/go/Wireless_Recommendations
- http://wiki.laptop.org/go/Wireless_Management_Traffic

From:
http://wiki.osll.ru/ - **Open Source & Linux Lab**

Permanent link:
http://wiki.osll.ru/doku.php/etc:common_activities:olpc:mesh:definition_eng?rev=1221932531

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