
An Experimental Study of Multimedia Traffic Performance in Mesh Networks

This paper details the experimental setup of a wireless mesh network within UCSB's Engineering 1 building, now HFH, in addition to results of some experiments ran over the testbed with respect to multimedia traffic.

The MeshNet Testbed was made up of twenty-five nodes. This short paper unfortunately is missing a related work section so I am unable to determine if this is the first time that a wireless mesh of this sort has been setup, or if it is the first time that it has been setup for the purpose of testing multimedia over it. Since there was a reference to the a MeshNet webpage I'm going to assume that the MeshNet test bed was already in existence when this paper was written, and thus why the paper only detailed a subset of the MeshNet. Specifically this paper chose to perform experimentation on a four-hop path between five of the twenty-five MeshNet nodes.

The five nodes for the experiment were selected by finding the five nodes with the most reliable communications between them. This immediately made me wonder if this selection is representative of what one might see over a typical mesh network. How would the results have changed if the five nodes were chosen at random?

Furthermore the paper, somewhat ironically, mentions that all the nodes chosen were gateway nodes, which happened to also have a wired Internet connection. This clearly doesn't represent the environment that a mesh network would be deployed in. I imagine the mesh network environment to be something like rural Africa in which it would be very unlikely that any interference due to microwaves or other wireless access points would come into play. The paper tried to account for this by performing experiments at night and comparing results collected at night, to those collected during the day but I don't think that sufficiently mimics the scenario in which multimedia will travel over multihop wireless networks.

One of the self mentioned goals in the paper was to share information with how to reproduce the experiments as such the paper describes a tool to synchronize time between two wireless nodes. The description of how the tool works leaves much to be desired. Particularly how many consecutive packets are sent, and why are there two different probe packets being sent simultaneously when it seems just one packet could achieve the goal. Furthermore they mentioned NTP was a problem because the error could be in tens of milliseconds, however this error seems acceptable considering their graphs on latency utilize a log scale and only one graph contains points below 32ms. Additionally I would have liked to see an equation for the derivation of the 10usec.

The measurements performed in the paper were pretty complete and clearly demonstrated circumstances in which performance decreased. One issue with the paper was the choice for RTS/CTS as I thought it had already been shown that there weren't sufficient benefits to using CTS/RTS in heterogeneous environments.

Additionally as RTS/CTS was made to solve the hidden terminal problem, it would have been nice to show through experimentation that this particular mesh setup had a hidden terminal problem thus would even theoretically benefit from RTS/CTS.

The most important take away from this paper I feel was that packet size had no impact on the number of supported flows over wireless. Of course the experiment only tested homogeneously sized flows, which very likely would never be realistic in the wild, nonetheless I think that is a novel finding.

Overall my opinion of this paper is that it could have used a little more work. This is a "oh look what we did" paper which neglects to explain why it is useful or who the target audience is. I'm sure the size of the paper has much to do with the omission of these topics. Nonetheless I stand by the opinion. Considering the content that was included the paper was structured very logically and written in a easy to read manor. The figures were commented on pretty well and for the most part were self-explanatory which is a huge bonus.

One final comment I have is with regard to this copy of the pdf. I am going to assume that this just happens to be a draft and not the final copy because frankly it is crap as the citation numbers were replaced with question marks and in numerous places words were split likely due to column justification. These two issues are very distracting while reading thus detract from my overall opinion of the paper nonetheless I attempted to overlook these mistakes in my previous evaluation.