

**PERFORMANCE ANALYSIS OF IN HOME POWERLINE
COMMUNICATION NETWORKS**



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ABSTRACT

The development of the mains powerline to provide communication services in the generally-known broadband application is receiving attention from electricity utilities and communication companies. The opportunity to provide Internet services, video-on-demand, and video streaming directly into the home or industrial building at cost effective prices and at a time when customers require such services is an opportunity not to be missed. Powerline Communication technology utilizes the existing wiring systems to distribute high-speed data and video throughout the home. The main advantages are due to its universal existence in homes, the ubiquity of electrical outlets and the simplicity of the power plug.

In this project, three types of home network designs are modeled and investigated by using the discrete event simulator called OMNeT++. The models are based on semi-detach house design and double-storey terrace house design for 8 nodes models and apartment design for 6 nodes model. The performance of the PLC networks operating over different number of channels and cable lengths are evaluated with the different network parameter such as the buffer size and the frame length. The evaluation is based on the queuing delay and the throughput of the network.

From the simulation results, graphs of queuing delay and throughput versus data rates are plotted. From the graphs it is shown that the number of channels and the cable lengths affects the performance of the networks. For 8 nodes model, network with 8 channels gives better performance compared to 4 channels. While 6 nodes model with 6 channels has given better throughput value than 6 nodes model with 3

channels. However, the effect of the cable length to the network performance is not very obvious since the lengths and the differences between them are small. This can be shown from all the layout models where the cable length used in each model measuring from the node to the hub is only in the range of 3 to 15 meters long. The effect of the buffer size and the frame length gives the unreliable results when it is plotted into graphs. This is due to the insufficient length of simulation time for data collection.