

Atit Kuprasert 2012: A Method to Determine Installation Locations of Access Point and Optical Network Unit in Fiber-Wireless Communication Systems for Provincial Electricity Authority's Advanced Metering Infrastructure by Using a Constrained K-Means Algorithm. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Wachira Chongburee, Ph.D. 49 pages.

This paper proposes a communication system design method for Fiber-Wireless technology (Fi-Wi), which is to be used in Advance Metering Infrastructure (AMI), a part of the smart grid. The system consists of two major subsystems: Ethernet Passive Optical Network (EPON) and WiFi. The proposed method is capable to determine the number and positions of access points (AP) and Optical Network Units (ONU) to cover AMI meters that are installed in a certain area by using a modified K-means algorithm. The modified algorithm takes into account the maximum range of Wi-Fi link, and the maximum number of meters that each AP can support. For ONU, the constraint is only on the number of meters that each ONU can support. Another constraint is that the AP and ONU devices must be placed on the grid. By using this method, the simulation results show that the number and the location of AP and ONU satisfy the constraints.

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