



Wireless Engineering Research and Education Center

Scalability and Security in Smart Utility Networks

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Abstract

The rapid deployment of smart meters across North America to measure consumption of utility resources such as water, gas and electricity has presented a problem of scale. The huge amount of data thus collected is being used to make demand-response applications smarter as a part of the Smart Grid initiative. The wireless mesh architecture is a popular deployment method for smart utility networks and Advanced Metering Infrastructure (AMI), due to the low deployment costs offered by this method. Severe limitations are imposed on the scale of deployment by wireless environment parameters such as fading and path loss, differing widely from home and outdoor to industrial and in-building scenarios. Reliability in such networks is strongly affected by deployment scale and vice-versa. In our work, we propose an analytic model for smart utility network scale as a function of link reliability and aim to deduce a relationship between network size and average link packet success probability for scales of deployment. We verify this result by simulating a routing protocol in large scale deployments and comparing with results from analytic model.

Bio

Gopalakrishnan Iyer received his Bachelor's degree (B.E.) in Electronics and Telecommunication Engineering from Mumbai University, Mumbai, India in 2008. After receiving his Master's degree (M.S.) in Electrical and Computer Engineering from Auburn University, is currently a Ph.D. candidate under the guidance of his advisor, Dr. Prathima Agrawal. His active areas of research include Wireless Networking for Smart Grid and Advanced Metering Infrastructure (AMI), state-of-art wireless network protocols and energy management schemes.

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<http://www.eng.auburn.edu/~pagrawal/seminar/2013/index.html>