A new authentication scheme and enhance authentication protocol for large scale metering in smart grids

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Abstract: Advanced Metering Infrastructure (AMI) plays an important role in the development of the smart grid. AMI is a computer network, which has to face the cyber security issues inevitably. Safety certification is one of the many cyber security issues. AMI have a lot of accessible devices, therefore it needs a simple and secure access mechanism. IEEE 802.1x is widely applied in solving the problem of wireless LAN users access authentication. In this paper, we propose a modified version of IEEE 802.1x protocol to meet the special requirements of AMI. In addition, we applied the modified IEEE 802.1x protocol also in our newly designed AMI architecture based on IPv6, and discuss the details of the authentication process. Finally, we build the experimental environment. We realize the design of AMI architecture in this experiment, and use the authentication mechanism proposed in this paper in it. Experiments show that the proposed authentication mechanism can meet the special needs of AMI, and our newly designed AMI architecture based on IPv6 has a direct commercial value.

Keywords: Smart grid, Advanced Metering Infrastructure, sensing architecture, authentication protocol, IEEE 802.1x, SCEP.

References:


