

Assessing the use of IP network management protocols in smart grids

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Abstract:

Conventional electricity grids evolve into smart grids by incorporating Information and Communications Technology (ICT) services. These services are meant to provide finegrained monitoring of the grid and pervasive control over its components. The ultimate goal is to avoid major failures and blackouts and to improve the efficiency of energy generation, transmission, and consumption. Smart grids support two-way flow of information and energy between the supply and demand sides at various levels from generation sites down to individual consumers. A smart grid can therefore potentially contain millions of intelligent devices able to collect, process and communicate data. These devices need to be monitored and configured to ensure proper operation. This is the role of a network management protocol which enables communication between a network management system and grid devices. Currently no protocol is widely accepted as a management protocol for smart grid devices. We, therefore, assess the use of some standard Internet protocols as potential candidates for this job. Namely, we consider the Simple Network Management Protocol (SNMP), the Hyper Text Transfer Protocol (HTTP) and the Constrained Application Protocol (CoAP). We compare these protocols according to a set of criteria that we propose. Also, we test implementations of all three protocols over the Arduino hardware platform. © 2016 IEEE.

Reference:

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