

Design and implementation of the data acquisition system of a large scale network based on four-in-one meters

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Abstract: For households, water supply, power supply, pipeline gas and centralized heating are necessities to maintain the normal life of a family. For Chinese urban families, water, electricity, gas, warm services are often provided by different government utility companies. Aimed at the shortage of the manual measurement of the above mentioned services' consumptions, a new mechanism using network metering devices is proposed in this paper. Based on the general network measurement mechanism and through analysis, this paper proposes using meter communication network as the public communication network of various metering devices, forming wireless mesh network by metering devices, constituting a virtual private network by the power company's network, and accessing to metering network based on SCEP protocol and certificates of devices. Under this new network measurement mechanism, a network routing optimization strategy, a data acquisition protocol based on IPv6 and a mesh network management system are designed, and preliminary experiments have been carried on. Experimental results show that the proposed mechanism can realize functions through the network, including the control of multi-measuring devices, topology discovery, data acquisition, fulfilling the multi-meter data acquisition system via network.

Keywords: Energy internet, four-in-one meters, wireless mesh network, virtual private network, SCEP.

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