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Smart grids enabled by edge computing

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Description A smart grid is the nervous system of the power generation, transmission, and distribution systems that makes a great use of the information and communications technologies (ICTs). The ICT enables the smart grid to timely detect, monitor, and react to local changes in usage and in the event of electrical faults of various types. The smart grid is the nexus of distributed electrical sensors, smart energy meters, smart appliances often deployed in customer premises, transducers, network interfaces, remote terminals, servers, and a multiplexed communication system which transmits data and commands between parts installed across the entire power grid system components. The main power grid components include the power generation station, high-voltage transmission system, distribution systems, and customer premises. The sensors that can be interconnected to one another using various network architectures and computing paradigms are the eyes and ears of the smart grid which provide information vital for efficient and timely fault detection, monitoring, and controlling the entire power grid system. Hence, the smart grid is derived from the general-purpose network architecture and computing models in a manner as to fit the purposes of the electrical grid system.

The main thing that distinguishes a smart grid from the general-purpose computer network is that it is one specific application of it. The most striking characteristic of computer networks is their generality. They are not optimized for a specific application like the smart grid. They are built principally from general-purpose programmable hardware capable of carrying and supporting many ...

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