ABSTRACT

As the growing interest in global warming problems in recently years and the power shortage after natural disasters, expectations for the home energy management system in the general households have been risen. Especially, not only the photovoltaic power, but also storage battery, fuel battery and cogeneration system which is used in a typical household are developed. Not only the conventional energy-saving standpoint, but also self-standing and fine powder for energy use includes energy creation and energy storage standpoints on which expectations are concentered.

Advanced control system development for those services and the cost of equipment installation has become a challenge. Home network systems are used for the equipment with chipped on one service now. Generally, equipment in household included various types by different makers. As a result, electric home controlling system and home information system should be appropriate for those equipments in the day-to-day update phase. In this research, traditional home network services are discussed. Then the author propose [services access intensive] which based on oneM2M and OSGi specifications. Method of implement these services and interfaces also discussed.

In this research, method of implement service and interface in home network system, use case is extracted from the home network service which is widely used, but common interface and common platform is not applied yet. For example, HEMS [Home Energy Management System], Contents Distribution System, Home Security System and Telemedicine System, can extract some use cases, and create these use cases based on common interface and common platform.

Analyze use cases of these home network services, these home network services could be clarified by the stander alone, the controllers intensive, the bundles intensive, the devices access intensive, the platform service and the services access intensive. In these patterns implementations analysis, since the description for characteristics of each pattern, design as an example for each pattern of HEMS, Contents Distribution system, home security system and telemedicine system. And create the diagram if introduce independent the system or introduce all of these systems. Comparative tables on home gateway, service, application bundle, devices relationship, end user and device usage are generated, advantages and disadvantages also been discussed.

From the analysis of these implementation patterns. The architecture of the pattern is proposed (the service access intensive). Service access intensive, function of the contractual relationship, service interface and device interface is centralized in the platform service. And those could remote control the home devices. The communications of application bundles and services are provided with the base services in home gateway and platform service. The architecture of home gateway system and platform service system with commonality and security is discussed. The home gateway system is explained from monotonic structure as well as dynamic structure. Remote services management, monitor and real time policy adjustment, policy management, communication management between devices and interface are discussed. Platform service system is explained from monotonic structure and dynamic structure. Basic functions such as bundle management, devices management and service management are discussed. In order to implement the home gateway management, remote service management, monitor and real time adjustment, policy function, device interface management and communication management are discussed.

Pattern analysis and pattern design in this research are discussed from the aspect of cost, maintenance, performance and security. From the overall comparison, [services access intensive] shows improvement in applicability, safety, maintenance and development. It is could be considered that implement of [services access intensive] is possible based on standard specification and technology.