Chapter 18
Remote Vehicular System Management Functions and Information Structure

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ABSTRACT

Due to the rapid development of information technology, the network has already spread to every corner of vehicle. With all kinds of ECU devices appear in the vehicle, and it brings the more and more convenient living. On purpose solving heterogamous technologies that are incompatible with each other, developed a "WBEM-based Remote Management and Heterogeneous Vehicular Network Diagnosis System" on OSGi Gateway. This system can focus on a variety of problems come from vehicle network, and find out what are the problems or where are the problems happened. If the problem still can not be solved properly, we must to seek for help from remote managers. The users can acquire enough information without understanding how to control every device, so that the users can help near diagnosis system to solve vehicle network's problems and to promote the abilities of near network diagnosis.

INTRODUCTION

Due to the vehicular network management system has not been standardized and lacking interoperability. In addition to the existing network management system has a simple structure consisting of server, provider and client, as communication between admin users and management server. This study constructs a remote vehicular network management and diagnosis system with OSGi platform (Ai et al., 2007; Sun et al., 2007) and WBEM (Web-Based Enterprise Management) to speed up the realization of the heterogeneous home network. Usage of OSGi platform provides several benefits. The most important one that it integrate different types of vehicular networking technologies, because currently most available vehicular network middleware and technology have no compatibility with each

Figure 1. Remote managing protocols
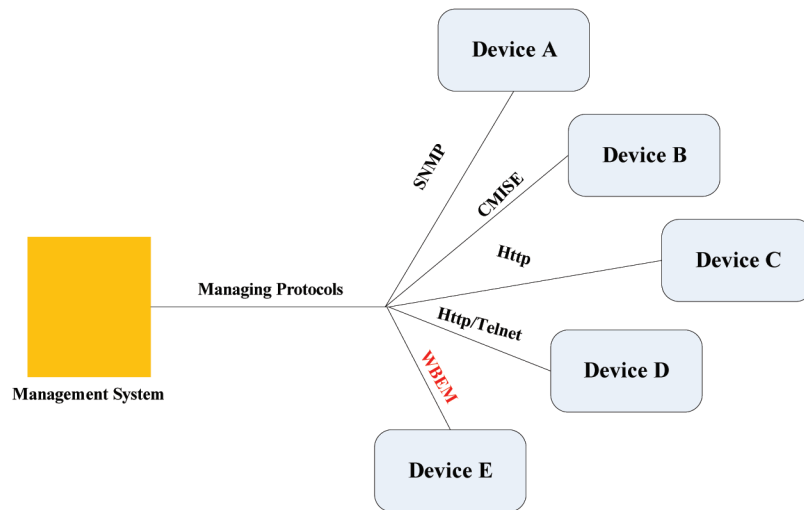
other, home devices based on these heterogeneous middleware cannot communicate with one another, even though they are physically connected.

The OSGi service platform is initially chosen for its capabilities to integrate components and services from different providers in the heterogeneous home network. (Marples et al., 2001; Saito et al., 2000) The OSGi service platform is specifically designed for devices that can manage remote devices through remote managers. Figure 1 illustrates these devices that need to be established some of remote managing protocols, such as SNMP, CMISE, CIM, OMA DM, and more. The OSGi Alliance decided that no managing protocol can be preferred over others because no protocol is suitable for all cases. The OSGi Alliance now has been working to develop a standardized management API to build functionality of remote management into unattended devices. This is a very powerful concept that offers the same interoperability as a standard protocol. However, the benefits of this concept are not always immediately obvious. The benefit of a standard protocol is that any device can be managed by any manage operators. Consequently, we apply Web-based Enterprise Management (WBEM) managing protocol to vehicular network environ-

ment. Using WBEM protocols, remote managers can easily manage devices through web interfaces, and operate with any manufacturer's device, regardless of the underlying protocols.

The proposed system uses the WBEM to provide more effective resource management and a larger range of services than before. Because the different types of vehicular network technologies and management instruction, need the different technology to manage the each vehicular network, like SNMP, Telecommunications Management Network (TMN) and so on. In order to overcome the situation that WBEM and CIM (common information model) provide an excellent management environment and promotes the information exchange across a variety of underlying technologies and platforms supported interoperability. The WBEM offer extreme flexibility and efficiency to manage method, that communication with each other different management type. Figure 2 illustrates overview of integrating OSGi platform with WBEM these two technologies and Remote management through Web-based Enterprise Management Architecture to the vehicular gateway.

The WBEM-based Remote Vehicular Network Management and Diagnosis System can figure out the status fast and easily, and realize the benefits

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