Chapter 16

QoS Guaranteed Based Network Management Policies in the Integration of Wired and Wireless Architecture of a Healthcare Network

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ABSTRACT

Every community in the world expects to have a high value of life. Therefore, budgets are pooling to the local healthcare unit to increase healthcare and medical services to their citizen. One common implementation in the healthcare system is a healthcare network, where all necessary information are transferred to safe patients’ lives. Various developments in medical equipments integrate communication circuit to enhance ability to transmit data direct from patients to medical staffs so that their lives can be safe in time. Since the implementation of wireless network is widely spread, this paper proposes the integration of the wireless network and wired network to serve a healthcare system under a management policy. The results have shown that the proposed architecture with policy has a better quality of services than another alternative solution using QoS standard metrics. Thus, the paper ensures that a qualified healthcare network can be achieved under the condition that the suitable architecture must be implemented and the right management policies are also applied.

INTRODUCTION IN HEALTHCARE NETWORK

People life is very important. Therefore, a healthcare system must be properly installed for every commu-

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is their information, especially medical treatment information and current symptoms.

There are various methods to store and send patients’ information and medical treatment, including some medical services over a healthcare network (HN). However, this HN must be guaranteed with quality of services in many aspects. However, services of an HN must relate to various persons (Raman, Jagannathan & Reddy, 1997), such as medical staffs, health insurance companies, government sections, clinics and other hospitals. Therefore, the network management model to enhance QoS of an HN must ensure that the security of the HN is maintained as necessary.

Although the security issue is a sensitive point in the healthcare system, the performance of the HN is also vital, since patients’ lives are always depended on their health information, these information must be delivered to the medical doctor in the right time, right person without a long delay. Therefore, performance of the HN has to be well managed. Even though the HN might be installed based on high quality architecture, having unsuitable policy may not increase performance of the HN as expected. Thus, the success of QoS of an HN can be obtained from the suitable architecture and the management policy.

In this chapter, before the QoS of a HN are mentioned, the requirements of an HN will be described in the following section following by types of data over the HN. After that the requirement for QoS of the HN is illustrated where performance issue is discussed. Moreover, a case study from a Thai hospital with two alternative solutions is elaborated and discussed. The last section will be the conclusion.

**REQUIREMENTS IN HN**

Saving lives is very important and very sensitive processes; it must consist of various factors, including information and time. Generally, information of patients in the legacy system of the healthcare unit was manually transferred. Moreover, some patients might get sick or feel uncomfortable according to sudden physical abnormality. Thus, under these conditions, the patients’ lives might not be able to be protected or taking care off because of lacking of necessary information in the required time interval. Therefore, functions of the healthcare system can be classified in three aspects: patients, medical staffs, and administration.

The functions of a healthcare system in the patients’ aspect refer to the patient’s monitoring system. Since some patients need special care or special tracking from medical staffs according to their illness, such as heart disease, diabetic, etc. The monitoring system needs to be installed for individual patient; so, whenever they are in bad condition alone, especially the elderly person, the monitoring system can directly report to the medical staff to save their lives in the proper time, or patients can inform their medical unit for help.

In the aspects of the medical staffs, functions of the healthcare system are the medical services that have to provide to patients. It is the truth that people expect high quality of medical services from all medical staffs when needed. The medical services include emergency lives saving, health consulting, illness treatment, laboratory test and diagnosis, etc. Although every government gives a high priority in granting budgets to the healthcare system, most rural areas always lack of critical medical services from their local healthcare units. Therefore, implementing an efficient HN supports these critical medical services for long distance requests. For examples, patients can send their questions via mobile system consulting their doctors for first aid treatment to prevent serious consequences of any physical or mental problems. In some countries, a telemedicine system was implemented to serve people in the rural area from serious injuries; operations can be performed by a local doctor guiding by specialist from the medical school or other central hospital.