Chapter IV

Bluetooth Scatternet Using an Ad Hoc Bridge Node Routing Protocol for Outdoor Distance Education

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Abstract

In recent years, the prevalence of Internet and wireless technology has promoted mobile communications as a major research area. For the future distance education purposes (Instructional Technology Council), to be able to access the course materials anytime and everywhere will become a key issue. Especially when students are out of classroom and are within a museum or a field investigation process, using Ad Hoc mechanism to access the real time brief or introduction can definitely improve their learning interests greatly. One of the topics is IEEE802.11, which includes the

wireless LAN and mobile ad hoc network (MANET) infrastructure (Perkins, 2000). MANET has no fixed infrastructure, but capable of dynamic changing network architectures, such as PDAs, cellular phones, and mobile computers. Bluetooth (The Official Bluetooth SIG) possesses a smaller radio range, low power, and low costs. The Bluetooth Scatternet is a specific case of MANET (IETF MANET Working Group). In this chapter, we propose a bridge node routing protocol (BNRP) based on a revised distributed topology construction protocol (DTCP), which a shortcut mechanism is added into it for better performance. The BNRP uses bridge nodes to preserve effective transmissions and achieve better Bluetooth Scatternet performance, and it can apply for outdoor distance education environment anytime and everywhere.

Bluetooth Scatternet and MANET

Distance Education

The process of extending learning, or delivering instructional resource-sharing opportunities, to locations away from a classroom, building or site, to another classroom, building or site by using video, audio, computer, multimedia communications, or some combination of these with other traditional delivery methods. Defined by ICT (Instructional Telecommunications Council).

Hence, the distance education is growing and more and more schools are using distance learning to assist teachers and students in study. Distance education can be divided into synchronous and asynchronous by time; video, radio and data by teaching mediums. Several kinds of distance education are shown in Table 1.

Table 1. Classifications of distance education

	Synchronous	Asynchronous
Video	Videoconferencing	Videotape, Broadcast video
Radio	Audio-conferencing	Audiotape, Radio
Data	Internet chat, Desktop videoconferencing, Web	E-mail, CD-ROM, Web

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