Integration of QoS Seeker into a Wireless Gaming Platform

Author – Mitsuhiro Sumiya
Supervisor – Dr. Robert Malaney, Mr. Xun Wei

0. What is the QoS Seeker?
The QoS Seeker is a system that guides users of a wireless network to a location where they can receive good Quality of Service (QoS). QoS can mean anything from delay, data throughput, signal strength of received signal, or combination of above. These QoS requirements depends on each application that requires network connectivity.

1. Abstract
A Wireless Gaming Platform was written to assist game developers create multiplayer games on Java 2 Micro Edition (J2ME). The QoS Seeker was then integrated into this platform with game-specific customisation, creating the first QoS Seeker for Wireless Gaming Platform (QoSS-WGP). Test results showed that this technology could effectively help users find good QoS. However, in order to run this program more seamlessly, we required higher level of computational capacity in handheld devices than what is available today.

2. Design & Implementation
2.1 Messaging Protocol
A messaging protocol between the game server and client was created with the following specifications:
(i) TCP Sockets were used to send and receive information.
(ii) The server maintains game states, and distributes it to clients.
(iii) Clients will send to server “events” such as pushing a button.
(iv) The message format is robust.

2.2 QoS Seeker Integration and Customisation
The challenges in integrating QoS Seeker:
(i) Lack of computational/threading power in handheld devices.
(ii) Balancing the allocation of screen space.
(iii) Premature J2ME environment.
(iv) Application level round-trip time measurement.

3. Field Testing
QoSS-WGP was deployed on UNSW’s UniWide public wireless network. The TableTennis game was written for testing.

Results:
(i) QoSS-WGP could successfully track QoS and user location.
(ii) The QoS information collected by user can be saved.
(iii) Handheld terminals need to be more powerful to improve execution speed of the game and performance of the network.

CONCLUSION
Driven by ever-evolving sophistication and market saturation of handheld terminals, experts speculate that demand for mobile gaming industry will grow astronomically in the near future. New generation of mobile games are expected to demand strict QoS requirements. QoSS-WGP will assist these games by helping the user secure necessary QoS over the wireless network. Testing done on a commercial network using a sample delay-sensitive game shows some very promising results for this technology. With anticipated release of more powerful PDAs and mobile phones, QoSS-WGP will be able to deliver high network performance to these resource-hungry games.