CMP-5037B Networks

*Design, implementation and evaluation of a secure VoIP communication system*

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Network Analysis

DatagramSocket

DatagramSocket2

DatagramSocket3

When sending packets across the DatagramSocket3 channel, it was clear that the issue of packet loss was being simulated here, as there was a noticeable degradation of audio quality in the data being received. Therefore, we came to the conclusion that our VoIP program would have to implement a compensation system for lost packets. To research this further, we put together an advantages and disadvantages table for sender-based compensation and receiver-based compensation, to decide which one would be better to use.

**Sender-based compensation**

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| **Advantages** | **Disadvantages** |
| **Better audio quality** – packets are re-sent when lost | **Slow** – for a real-time system, waiting for a packet to be re-sent is **highly impractical** |
| **Reliable** – acknowledgements are set to determine whether a packet reached the receiver or not |  |

**Receiver-based compensation**

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| **Advantages** | **Disadvantages** |
| **Faster –** concealment of occurrences of packet loss can be applied much more quickly | **Audio quality is affected –** a degradation in audio quality is noticeable when using techniques such as splicing |
| **Good for short bursts of audio** – techniques such as repetition or using a fill-in packet are effective for short bursts of audio |  |

Through this analysis, it became clear that using receiver-based compensation, specifically repetition, would be the most appropriate for our system. It’s much faster than server-based compensation, which is crucial as speed is essential in a real-time system. Furthermore, it’s effective when only a small amount of packets are lost in succession, making it easy to conceal this effect for short bursts of audio.

DatagramSocket4

VoIP System Design

Security

QoS evaluation

Project management