Wireless Networks Case Study Discussion Summary

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One of the topics that we discussed at the outset is the idea of negligence in the case of wifi networks. We discussed if assigning responsibility to regular homeowners with very little technical knowledge of wifi networks and wifi security to set up and maintain secured networks was appropriate. One viewpoint that was brought up is that most regular homeowners do not have a thorough working knowledge of wifi security and many times even when security is enabled it will be the default security settings provided by the security provider. An example was that the password for many wifi networks is simply admin because it is the default password set by routers when a wifi network is first set up. What was agreed upon was that security is not easy to guarantee when user input or user experience is needed.

This led our discussion to an article pertaining to a company that sued Massachusetts citizens for neglecting to secure their networks resulting in the illegal distribution of digital media. The general consensus was that the lawsuit itself was a long shot because to prove negligence the plaintiff must first establish several elements: duty, breach, casusation and damages. In this case the defendant’s duty to provide a secure wifi network would be hard. A lawsuit involving sailors not properly setting a radio to chart routes for ships was mentioned as an example of how negligence could lead to unwanted consequences. One opinion of the issue was that negligence on the part of the user should be minimized by making the costs of providing substantive security very little or very convenient. The rationale behind
this opinion was the major obstacles behind questionable security are overall inexperience and lack of expertise.

The discussion then transitioned to differences between 3G and 4G and infrastructure behind it. The issue of varying technologies being labeled “4G” and how different providers had different speeds that fell under the umbrella term of 4G. It was noted that the inconsistencies in the definition of the term 4G have led to consumer confusion when purchasing mobile devices. It was established that there is no concrete definition allowing the term to be more for commercial use rather than technical or academic use. From this perspective, any company can manipulate customers into upgrading their phones or signing a more expensive contract without being obligated to guarantee any specific standard. One detail that was mentioned during this discussion topic was that the International Telecommunication Union had established a specific and detailed standard for what should be considered 3G and 4G, yet no company has acknowledged these standards and the standard has not seen adoption on a wide scale.

This topic led to a discussion on whether 4G speeds were enough to allow the average user of the internet to browse the web and perform other daily tasks on the internet. An article was mentioned that stated a customer under a Sprint data plan attempted to use 4G as a wireless network within his home. 4G was found to be adequate for checking email and browsing web for things such as news, but 4G was still not viable for streaming high definition video or playing online games. We then discussed that perhaps it would be wise to partition wireless networks so that certain activity that used more bandwidth may be allocated for that activity, while
activities that required light bandwidth could be given another wireless network. This then led to the discussion of the issue whether radio frequencies as a whole were large enough to support such an array of partitions and whether at some point in the near future, the US may run out of radio frequencies to assign to specific companies or specific activities. Although no one was sure, one alternative solution that was mentioned was that some frequencies that are currently are assigned remain largely unused. One example was that the company AOL uses a very small spectrum of the frequencies that it has been assigned. One question that was mentioned was whether these frequencies had a specific range and whether that range could be extended.

An alternative solution to the issue of radio frequency limitations was proposed, which was using internet as a medium for phone calls and text messaging. The term communication protocol voice over IP or VOIP was mentioned. One person outlined that VOIP is difficult as a service to transition to for phone calls because data packets sent over wireless signals must constantly be correct and uncorrupt and that any single packet that is corrupted would compromise the quality of the service, thus it was difficult to ensure a steady connection for both sides of a phone call through VOIP due to the way wireless communication worked. Also, one problem that was posited was that wireless internet networks would have to upgrade or improve the upload speeds of its service to match that of its download speeds if phone calls and video streaming would be viable. One person noted that many service providers have a sizeable gap between their download and upload speeds and this would most likely be an issue for phone service providers.
An idea was mentioned that suggested certain forms of data be filtered and sent through a wired connection while other forms of data can allocated towards radio frequencies. This solution is viable but we noted that this then raises issues of net neutrality and violates the end to end principle in the sense that providers must then know specifically the data packets that are being sent from particular users.

A different topic was brought up discussing the future prospects of wireless connectivity and the dispensing technology for what would be dubbed 5G. An article was mentioned stating that the proposed technology for 5G would be through a stationary aerial machine that would dispense wireless signals downward. The advantages of such a technology would be that physical obstacles would no longer be an issue because the signal is projected downwards and thus physical obstacles such as buildings, transportation infrastructure, or natural infrastructures would no longer be between the wireless station and the user. We agreed that this technology would be a potential advancement towards a faster and more widespread form of wireless networking and setting up such technology would be much easier because it would require less infrastructure.