CISC 181 Lab 8 Networking

Most of the problems on this lab ask for Web addresses (URLs) of sources. You may give the same source for more than one question, but if you are referencing a long article, please try to link to the part of the page containing your answer or include a note to the TA describing your answer's location on the page (e.g., "Paragraph 5.").

1. (2 marks) Name one of your connected devices (e.g., iPhone, Google Pixel phone, Windows PC, iMac, etc.). and briefly describe the steps required to find its MAC address. (Note: If your device has more than one way of communicating on a LAN, say both Ethernet and Wi-Fi, it will have more than one network interface controller and more than one MAC address. Don't worry about that.)

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| Device: | iPhone XS |
| Instructions for locating its MAC address: | Settings.app > General > About > Wi-Fi Address |

1. (4 marks) Bluetooth is mentioned briefly in the lecture notes. Bluetooth, like Wi-Fi, is a set of wireless connection standards, but Bluetooth and Wi-Fi differ in implementation and purpose. One such difference, for example, is that Bluetooth typically uses less power than Wi-Fi, but this comes at the expense of range. Describe, with examples, two more such differences and provide Web references that support your answers.

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| Difference: | Security of Bluetooth is less then wifi |
| Source URL: | https://www.geeksforgeeks.org/difference-between-bluetooth-and-wi-fi/ |
| Difference: | Bluetooth has a much lower bit-rate then wifi (2.1Mbps vs 600Mbps) |
| Source URL: | https://www.diffen.com/difference/Bluetooth\_vs\_Wifi |

1. (2 marks) Devices with Ethernet or Wi-Fi talk to one another on a local-area network (LAN). Find, on the Web, the term (or a term, if you find more than one) used for a network of Bluetooth-connected devices.

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| Term: | Piconets |
| Source URL: | https://learn.sparkfun.com/tutorials/bluetooth-basics/how-bluetooth-works |

1. (2 marks) Frequency hopping is a technique used in Bluetooth to reduce problems with radio interference by automatically cycling communications through several frequency channels. An Austrian-born American movie star was one of two people who filed a patent on the technology during World War II, envisioning it as a secure method of controlling radio-guided torpedoes that wouldn't be vulnerable to [jamming](https://en.wikipedia.org/wiki/Radio_jamming). What was the screen name of that movie star? Cite your (Web) source of information.

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| Name: | Hedy Lamarr |
| Source URL: | https://en.wikipedia.org/wiki/Hedy\_Lamarr |

1. (6 marks) Our slides for the networking unit don't describe the infrastructure connecting WANs together. Not surprisingly, fibre-optic cable is used for the purpose, but since most of the world's surface is covered in oceans, much of this cable is underwater. You can view a detailed map of these cables here: <https://submarine-cable-map-2020.telegeography.com/>. Many (by no means all) of these subsea cables are privately owned.

For each of the questions in this section, provide an answer and a (Web) source.

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| Question: | What company owns a transatlantic subsea data cable that "went live" (became operational) in September 2020? |
| Answer: | Google |
| Source URL: | https://en.wikipedia.org/wiki/Dunant\_(submarine\_communications\_cable) |

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| Question: | What is the design capacity (maximum bandwidth) of that cable? |
| Answer: | 250 Tbit/s |
| Source URL: | https://en.wikipedia.org/wiki/Dunant\_(submarine\_communications\_cable) |

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| Question: | The same company is planning to make another transatlantic cable operational in 2022. What name has it given that cable? |
| Answer: | Grace Hopper |
| Source URL: | https://www.zdnet.com/article/googles-mega-capacity-new-transatlantic-submarine-cable-is-ready-for-action/ |

Submit your completed document to onQ by the lab deadline.