In this lab, we will look at a common situation involving home network design, concentrating in particular on trade-off issues between wired and wireless local area networks (LANs). A close family friend is building a new two-story, 1500 square foot house (25 feet by 50 feet). She wants to ensure it is capable of networking her family’s three desktop computers together. She and her husband are both consultants and work out of their home in the evenings a few days a month (each has a separate office with a desktop computer, plus a laptop from work which is used less frequently). Their two school-age children have a shared desktop computer, as well as a gaming console (the gaming console has built-in Wi-Fi capability and an available Ethernet port) in their playroom. Both the gaming console and the children’s desktop computer need Internet connectivity. The family also owns a modern laser printer which has Wi-Fi capability and an available Ethernet port. They have asked you to make recommendations regarding how to network their home. Here are two different general plans they have proposed:

1. Wire the two offices and playroom with Ethernet Cat 5e cable and put in a 1000Base-T switch for $40.
2. Install one Wi-Fi AP ($85) and put Wi-Fi cards in the three desktop computers for $50 each (the laptops already have Wi-Fi capability)

You may recommend either option, some combination of the two, or your own independent solution (provide reasonable, generic cost estimates for any equipment not listed above). Justify your recommendation by discussing cost, performance, convenience, ease of setup/maintenance and security. To complete the assignment, **upload a Word (.docx) or Adobe (.pdf) file with a write up on your recommendation and justification factors as your submission to this assignment in Blackboard**.

Assumptions: they are going to build ethernet ports (2 ports on wall plate) in majority of the rooms

I would recommend that the family gets a wireless and wired router which an optimal one would cost $70-$200 or a service provider router $10-$20 a month. I would put the router in the playroom so that the other desktop and the game consoles connectivity to the internet is stronger. The closer the router is to devices the better the connection between them will be. Then I would wire a wire the two offices and playroom with the Ethernet Cat 5e cable and put in a 1000Base-T switch for less than $40. The two office computers can connect to the router via ethernet ports on the walls. The router would also be connected to the ethernet port in the wall. Lastly, the printer would also connect wirelessly. Looking at what they do, which is offer “advice and expertise to client organizations to help them improve their business performance”[1], I assumed the printer would be used less. Since routers signals can be affected by thick walls and floors the connection to the printer would possibly be weak but, due to the assumptions in the previous sentence I believe it will meet the requirements for any needs of the parents and or the kids if the printer is place in one of the offices.

For this plan I wanted to balance wired and wireless connection. Since a one-on-one connection is a lot faster than wireless connections it would be better for the 2 offices to be able to connect to the router through cables and the wall ports. The set up is easy as all you would need to do is connect the cables to the ports in the wall which would then connect to the router upstairs. I didn’t want to just focus on the parents’ needs, so to account for just as fast internet speeds as the parents have, I would put the router closer to the desktop and the gaming console. This set up is also easy as you can connect your devices through its settings. For security, a router commonly uses WPA2, a network security technology that uses the most secure encryption options in the market.

In total, it would cost less than $250 dollars and the maintenance for this plan would be the cables which would have to be replaced after 5-7 years or the router if the family plans to upgrade it.

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[1] <https://targetjobs.co.uk/careers-advice/job-descriptions/consultant-job-description#:~:text=Consultants%20offer%20advice%20and%20expertise,range%20of%20industries%20and%20specialisms.>