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**Part 1:**

Assess the different link speeds on cisco routers for the different interfaces to identify what category of cable/speed should be used. Take, for example, if I wanted to run on the Gigabit interface from 1/0 on Router 2 to 100 meters away on SW1 at interface 0/2, I would have to use a Category 5e cable at the minimum. Likewise, if I wanted this Gigabit link between the 2 devices to be 10 gigabits (10G), I’d have to use Cat 6e at a minimum if I wanted it to go anywhere above 55 meters, which is what Cat 6 is limited to. Cat 7 is another popular option, as sometimes, Cat 6e doesn’t have very good performance at 100 meters and 10 Gigabits per second. Cat 6e still has better power of ethernet performance than Cat 6, though. Again, I’d recommend all companies transition to fiber if it’s possible because of the performance and ‘strength of connection integrity’ it brings.

Network Map:

A diagram of a computer network

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I used the Cisco Router Settings on R2 through a Terminal session with PuTTY, where I found the link speed in Kbit/sec for each interface to determine what cable type could be used. This information can also be used to troubleshoot physical and software type of issues on different devices on the network (network troubleshooting lab working with these attributes in a separate document/project):

A screenshot of a computer program

AI-generated content may be incorrect.

&

A screenshot of a computer program

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From these results, it’s clear that interface 4/0 uses Cat 5 Fast Ethernet (not 5e, which is a gigabit but can appear to be ‘fa’ fast ethernet in the ‘show ip interface brief’ command). It’s also clear that the gigabit ethernet link on gig 1/0 is 1 gigabit of bandwidth, not 10, 20, or 40 gigabits which also use the monicker ‘gig’ on the interface. We definitely don’t want to plug in a cable far too fast or too slow for the port on this router! From the show interfaces command on a certain interface, EMI, RFI, cable degradation, open impedance mismatch, overworked router/switch hardware (CPU, Memory) and more can be deduced.

**Part 2:**

I utilized the tool ‘Netspot inspector’ to check the area that my ISP’s CALIX IOS Router/Switch/AP all-in-one operated in. The purple band is my Access Point; the others are different networks in neighboring apartments:

A graph of a signal

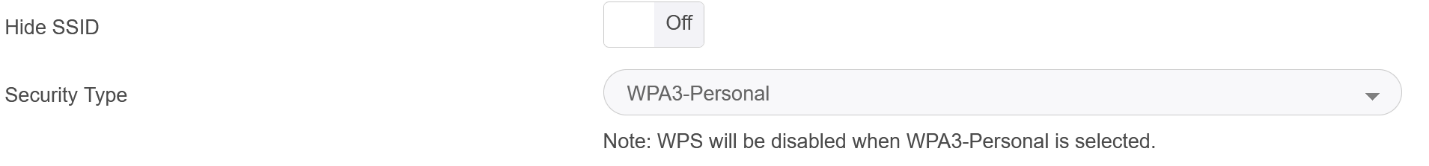
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Notice how there’s 3 networks on the right that are similar channels and frequencies. It’s fair to say that the orange and red ones would have significant interference and connection issues. Here’s another view of the networks’ info (omitting PII):

A screenshot of a computer

AI-generated content may be incorrect.

The security type on the WLAN controller was configured to be WPA3 Personal, as you can see on my Calix EXOS settings page:

Additionally, for my network, I can see how strong the signal is where my PC is located (I usually use ethernet for this reason: the wall interferes with the close by 5GHz beam. Keeping a signal higher than -50 dBm is a good number to go for when spacing APs and their antennas apart in a network. Power over ethernet of different versions can power these APs- and if I wanted to set some up in my own home, I would DEFINITELY use Unifi APs and WLAN controllers if I got the chance. It’s all the rage in the tech community these days. The security they offer is tantamount in achieving the ‘industry-grade wireless security standard’.

The A+ Core 1 Exam tested in a hands-on environment how to place APs/routers in a room properly given sources of interference. Reflections, refractions, and absorptions must be watched for- including devices like Cordless Phones, One-way radios, and microwaves.  
These can be mitigated by adjusting the gain (power level) and signal on the antennas of APs too- by ‘signal’ I mean getting a smaller antenna configured on a different frequency to absorb the refractions/reflections/absorptions, so the main antenna gets a clean signal.

**Identifying Fiber Cabling:**

I also learned that Ethernet Copper cable speeds cap out at around 40gbps with Cat 8, then fiber is required to use at speeds like 100gbps. Single-Mode-Fiber Cables, suitable for long distances, it typically the color yellow. Multi-Mode-Fiber Cables, on the other hand, usually are orange, aqua, or lime green. 🡨 Not in Network+ Exam, but something discovered in-the-field or in Training

Identifying all of the different connectors for Fiber is very easy for me. I can visualize very much based on how they look or what needs are defined, what type should be used in an industrial/chemical (MICE cable, Straight tip connectors), dense urban (little/local connector), or building to building context (SFP/GBIC ranges in 4/40Gbps QFSP/QFSP+), and why from the A+ and Network+ exams and content too. I even remember seeing straight tip connectors in use in the Optical Network Terminals at Dot Foods. They were round with a BNC locking mechanism, not like normal cables as I drove my forklift by loading goods/merchandise to and from the doc, counting and entering it into each ticket in the inventory program (the APs throughout the warehouse were powered with 2 separate cables, one being the straight tip one going through the ceiling and down to the ONTs plugged in, and back up a different cable to the main servers for aggregating and verifying the orders service level/production/other info, by my observation- roughly.