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Assignment 2 – Refined / Redefined Idea
EE – 322 – Design 6

LED Ethernet Cable

Overview

When trouble shooting a network problem a first step can be to verify the physical network connection. If the end device in question is right next to its next hop it is an easy job; check the cable is in working condition, verify that the cable is connected into the correct ports and that the link light are on at either device.

However it can be a rare case when the two are in close enough proximity for this to be possible. Devices can be located anywhere within a data center or a Main Distribution Frame which can spread over hundreds of feet, or even on different floors of a building. If there are only the two devices it would be a simple feet over the distance, but this is not usually the case; the devices will be mixed in a field of hundreds or even thousands of devices and connections. Depending on existing documentation and physical organization of the equipment it could be very time consuming to locate cables and connection points, and then determine which point is the cause of failure.

As there are link lights at each device one can then easily determine if there is a basic network connection active, that is if one has access to each device. Rather than it being a requirement to have access to the device to see a link light, it could be possible to go to any connection point in the run and see a link light. This can be accomplished by have LEDs embedded within the connectors at either end of every cable within the end-to-end run. These

LEDs would look similar to those in some USB devices that light up when connected. They would not require any additional cabling to power as they can utilize that which is in the Ethernet, however may require Power over Ethernet devices. These LEDs could display information such as full end-to-end connection being active, or only a connection up to a certain point is active.

The cables could add functionality, without requiring extra outside equipment to use. They could be used in a variety of applications further than just assistance in trouble shooting. In the initial set up of devices, or with a changing environment, it would be easier to determine which connections were active, inactive, or need to be made active without the need to go to every end device that was added or removed.

Stakeholders and their potentials.

As with every project there are stakeholders and each will have a different list of requirements that they will need, the stakeholder's are the users, clients, and designers. For this project each member will comprise the design group. The client would be anyone that will be producing or selling the designed devices. And the users are potentially anyone that uses a network cable; however the product will be geared towards larger networks.

Users will be concerned with the function of the product. They will need them to be as reliable as or better than cables that are currently in the market. They will need the cable LED lights to be easily seen and be able to determine what they mean. Users will need to know they will reduce the time for them to troubleshoot a problem, set up a new environment, or any other

of the cables many uses, as well as reduce their overall cost to do these tasks. It may also be preferred that they are compatible with all their existing equipment.

Clients will be concerned with the production and sale of the product. Clients will require that the product be simple and have a low cost to produce. They will want to know that it will meet all of the user's needs and be a marketable product. The product being produced needs to be more advantageous to them and their users than any cables that are currently on the market.

The last stakeholder is the designer of the product. They are concerned that the project should not be overly complicated so that the time to production is too long. The final product should be simple to manufacture, while keeping costs down. More importantly the final product needs to meet all the needs of the clients and users.

Project Evaluation and Skill requirements

This project is very practical in the sense of cost, time, and skill required to complete. It should only require simple skills in electrical engineering, as well as some manufacturing engineering skills. There will be a need for the skill in testing the final product and verifying that the addition of the LED does not degrade the signal, which is the primary purpose of the cable.

The cost of developing a sample unit will be minimal. The materials needed are readily available, from a large variety of vendors. The main cost for materials will be in LEDs, Ethernet cable, and plastic for connector. Any equipment needed to create and test the product will be a majority of the cost; cable testers, network hardware, etc.; as well as facilities to produce and test the product.

SWOT analysis

This products strength can be in its simplicity. It is something that is not overly complicated to design and manufacture. It is further not expensive to produce. However with its simplicity it has great use in its target market. It would not require its market to change to utilize it to its full capacity, and could greatly improve the work environment for those that use the product. Its weakness is that it is nothing revolutionary. It would add functionality to something that has been in place for years and may not be seen as something that needs improvement. It however could be seen as a minor change to something widely used that is desirable. It could evolve into the standard of how Ethernet cables are produced everywhere. Its threat however is if it potentially requires PoE devices to operate it would drastically decrease its market size and potential for growth.