Assignment 2

Field Trip to Network Server Room

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The first thing I noticed when the class went into the server room were the two rows of server racks. Then I took notice of the two floor-to-ceiling air conditioning units in either side of the room. The layout, as we found out as the tour went on, was this; the first had the servers for the USC Upstates Virtual Machines that are used campus wide, racks to expand into when new hardware is acquired, and racks to setup new equipment before it is installed. The second row consisted of the batteries and Uninterruptible Power Supplies for the equipment in the room incase the power goes down, the routers that bring the internet access into the room and the switches that transport that access around campus, and lastly a rack owned and operated by the state legislators.

First, we got too see under the floor at the lines of cable. The floor is built with a gridded metal frame, with tiles that sit in each grid square. The whole grid that makes up the floor is twelve inches off the concrete foundation. Using a suction cup, you can remove the tiles from the frame. A few were removed so that we could see the cable runs underneath. Every cable run is lifted off the floor and stored in a basket type thing so that any leaking water will not interfere. The cables that I could see were power cables, ethernet cables, fiberoptic cables, and a few others I couldn’t make out.

Second, we looked at the servers in the first row. Each had ethernet coming off them, running to the side of the rack and down into the floor. There are ports on the back to hook up a laptop so that you can setup up and run maintenance on them. The power cords connected to a long power strip that also ran under the floor, leading over to the batteries and the UPS rack.

Third, and the one we spent the most time one, were the router and switch racks. In these were many routers and switches, many used for redundancy. Three router’s each had main fiber optic lines running into them from opposite directions into the campus. This was so that if one were to be broken or damaged, the university would still have internet access. Those routers were connected to switches than then ran fiber optic to the other buildings on campus property. The most interesting thing I noted were the different color fiber lines being run.

The fiber lines being run to and from the switches were yellow or orange in color. This color difference distinguished which exact fiber lines were being run. The orange fiber lines were connected to the routers, then run to the switches. Some of the switches had orange fiber coming from them that connected to other equipment in the run. This fiber line is “Multi-Mode Optical Fiber”. The yellow fiber is “Single-Mode Optical Fiber”, which come from the switches were taken under ground and ran throughout campus to the different buildings.

The Multi-Mode Optical Fiber, as I found out during the tour, was used for short distances. It has a higher speed capability than the Single-Mode, but is also more expensive. It generally is used for distances up to around 600-700 meters, as the signal gets weaker and may get lost after that. The Signal-Mode is cheaper to use, but is also slower. Due to how it’s made, the signal will be carried much further than Multi-Mode Optical Fiber. So when going underground a long ways or to different buildings, the university uses this type.