Additional Considerations

The Fayetteville office will need to have a cable modem. They will also need a dedicated computer to serve as a router for their traffic, or they could use an off the shelf routing solution. To keep the office organized and allow for effective redesign of the network, they should utilize patch panels and managed switches to connect all their on-location devices, depending on the devices they would most likely need the capacity of anywhere from 48-96 ports on their switches. In most cases, these pieces of networking hardware will come with their own software solutions for management and reporting, and other open source solutions exist to extend many of the organizations capabilities.

Since not all the computers are wired the new office will need to have wireless access points. The wireless access points will allow employees with laptops to move freely around the building while staying connected to the network, and the access points could be segmented on the network to allow for a public guest and a private internal network.

For the Fayetteville office to be able to send their large print jobs to the Austin office the office will need a print server. A print server will support remote printers and allow the office employees to send their large scale print jobs over the WAN.

The Fayetteville's teleconferencing needs will require a minimum bandwidth of 2.0 Mbps per call (Bhardwaj, 2018). To calculate total bandwidth required, according to Bhardwaj (2018), "Bandwidth required for one Video conferencing call X No. of simultaneous video conferencing calls +20% additional for IP Packet overhead". Fayetteville will need to determine the average number of video conferencing calls that may take place at a given time to determine the correct bandwidth requirement for the office, both upload and download.

Potential Errors

One common network issue that could affect the new office is an intermittent network connectivity issue; in this case the subnet router should be checked to verify that it is correctly configured. Errors in the configuration of the router could cause the intermittent connectivity issues. Another possible cause of this connectivity issue could be black hole routers. Black hole routers will drop packets if the size exceeds the Maximum Transmission Unit size (TestOut, n.d). To locate a black hole router a command can be run to probe all routers, incrementally increasing the packet size. The responses can then be analyzed to identify any routers that begin to drop packets.

Slow application performance is another issue that may affect the new office. This can be checked by analyzing your packets. Large packets may be lost due to system limitations. These limitations will need to be addressed to allow the system to handle large packets to ensure business runs smoothly. Troubleshooting methods like these will allow the IT department to quickly rectify the issues at hand preventing excessive downtime within the Fayetteville location.

The Fayetteville office must be able to effectively communicate with their customers as well as the other offices in the agency with video conferencing. They must also have the capability to send print jobs to the billboard printers in the satellite office located in Austin, Texas. Another business concern that needs to be addressed by the internet is the speed. With the number of employees in the office the internet cannot have a high latency. These business objectives must be met, and the best option for the is to locate the new site in Fayetteville, and to provision this office with a star topology LAN and the use of Spectrum's cable internet service for the WAN component. This would provide the needed capabilities at the lowest cost.