

GAI WAN Refresh

By

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Abstract

Great American Insurance, or GAI, has an aging infrastructure with multiple remote offices having old WAN equipment. There is a variety of models being used that does not allow network upgrades to happen as quickly as necessary, and device management is also made more complicated by using older hardware. With the objective of upgrading the current equipment with new equipment that is able to handle future upgrades as well as provide uniformity across all remote offices in order to more easily maintain, monitor, and upgrade the network. New hardware has been installed at every office within the United States as well as installing fiber lines to each location if it is currently using copper wiring. I am taking part and handling the installation of one remote office containing a router, switches, a WAN optimizer, and wireless access points if necessary.

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GAI WAN Refresh

Problem and Need

Great American Insurance, or GAI, has an aging infrastructure with multiple remote offices having old WAN equipment. There are a variety of models being used that do not allow network upgrades to happen as quickly as necessary, and device management is also made more complicated by using older hardware.

With the objective of upgrading the current equipment with new equipment that is able to handle future upgrades as well as provide uniformity across all remote offices in order to more easily maintain, monitor, and upgrade the network. New hardware has been installed at every office within the United States as well as installing fiber lines to each location if it is currently using copper wiring. I have taken part in configuring and handling the installation of one remote office containing a router, switches, a WAN optimizer, and wireless access points. This new and updated equipment allows the office network needs to be met moving forward, and will be easier to maintain the equipment as it is running the same version of software across all remote sites.

Constraints

The major constraints of this project are due to the fact that GAI is in control of the project, and all decisions are approved by the CIO. There are benefits to this as well. I am not in control of the budget, and do not need to manage any finances associated with the project.

Budget

The budget has already been approved for any and all expenses needed. I do not know the exact budget allowed for this project, because that information has not been provided to me, but I have estimated that the project is near the two million dollar mark based on the individual site cost times the number of sites being updated.

Solution

The size of this project is large enough that offices are being upgraded from September 2013 through May 2014. GAI has chosen to implement the WAN refresh using two model office deployments. There were originally three models, but Model A was rejected by the CIO, and only Model B and C are used. Model B consists of 6Mb AT&T circuits with 5Mb CBTS circuits used for Internet traffic. The WICs are installed in a 2900 series Cisco router with a Verizon 4G backup card. These sites have model 755 Steelheads installed and use Cisco 2960 POE 24 port and 48 port switches. Model C offices are used for the larger offices and use 3900 series Cisco routers, with model 1555 Steelheads. Model C locations also use Cisco 2960 POE switches with the same WICs used in the smaller Model B offices. Each office has had Fiber lines run to replace the current copper cables for increased bandwidth. Each location has the ability to be upgraded at a later date if necessary with 10Mb WAN cards. SIP has been also be installed at several offices during the WAN refresh, with some offices getting SIP phone installation at a later date.

WAN Optimization

Most of the research I have done on this project has been associated with which WAN optimization should be used. It was decided to use Riverbed Steelhead WAN optimizers, and I researched to determine if this seemed to be the best choice. The first reason I found behind

choosing Riverbed over Cisco was the specialization of Riverbed in the area of WAN optimization, versus the broader network focus of Cisco (Poppe). Cisco does have the benefit of integrating directly with the Cisco routers being used (“Wide Area Application,”). Great American Insurance already employs Steelhead devices, so I was able to test the optimization when using the WAN optimizer and it was very effective in decreasing WAN traffic. Projected usage went from 10 megabit per second to 3 megabit per second. I did not have access to Cisco WAAS WAN optimizers, but the testing outside tests showed that Cisco WAAS has become more efficient in handling up to 150,000 concurrent connections (Schultz). Cisco WAAS does not support UDP traffic either (Schultz) which would cause issues with some thin clients, but Great American Insurance uses Citrix which does not run on UDP (Schultz). At the end of the day the main reason for choosing a Steelhead over WAAS was the toolset provided by Riverbed. The RiOS offers much more granular control over the traffic than WAAS seems to, and allows you to customize the rules more efficiently (“Steelhead Appliance Installation and Configuration Guide” 2012,). Failover for the Steelhead is simply a straight through connection that bypasses the WAN optimizer if the device fails (“Steelhead Appliance Installation and Configuration Guide” 2012,).

SIP

SIP implementation is taking place at certain sites, but not every office location as originally planned. The Avaya phone system is used at Great American Insurance. Transitioning from T1 lines currently used, to a SIP platform from Avaya allows more scalability (8), and less cost. The company is only paying for the bandwidth they need on a SIP trunk, and they do not have to pay for multiple T1 lines.

Network Diagram

Below is a network diagram that illustrates the average office setup after the upgrade has taken place. Each site has three WAN cards. One AT&T circuit for WAN traffic, one CBTS circuit reserved for Internet traffic, and a Verizon 4G backup card for failover.

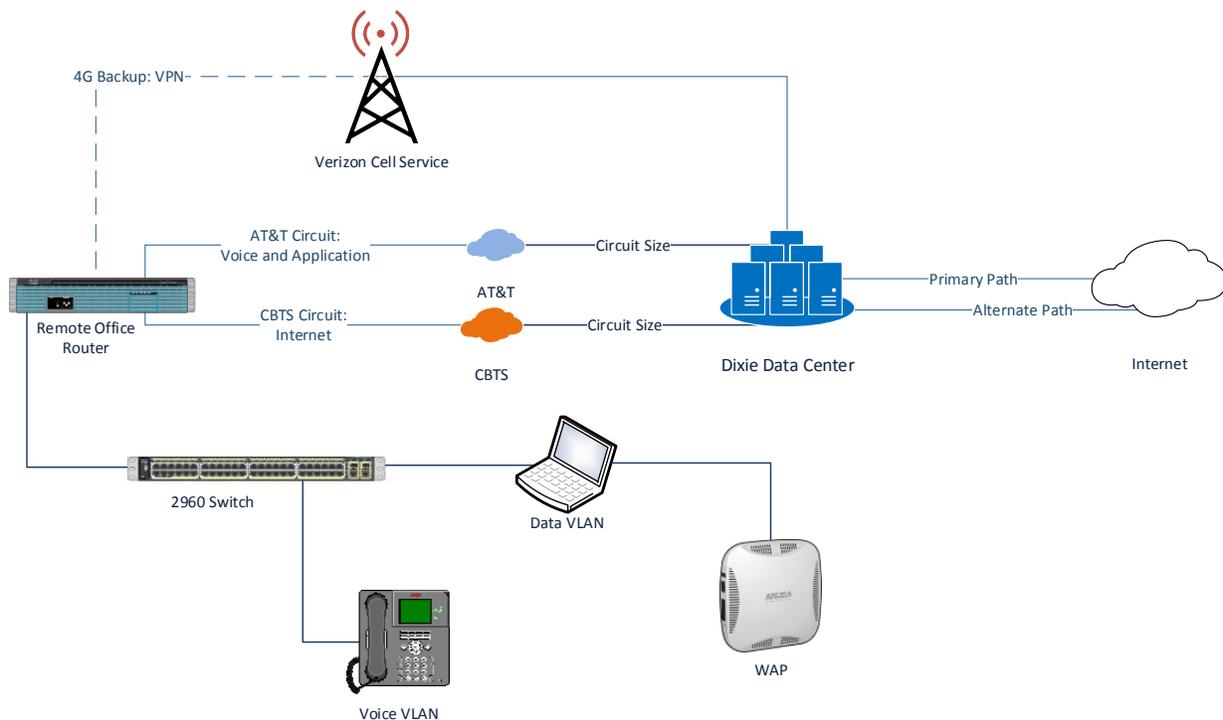


Figure 1: Network Diagram

Conclusion

My responsibilities for the project are administrative duties involved in project management, and installing new hardware at a remote office location. The remote installation includes configuring and installing a Cisco switch, Cisco router, Riverbed Steelhead, and any necessary Aruba wireless access points. The manual installation of the WICs in the router is also necessary. I have contributed to multiple sites handled by other team members at GAI as well. The objective is to get as comprehensive a view as possible into a large scale, companywide

WAN upgrade. This involves understanding and using Cisco IOS, RiOS, NetQoS for monitoring, and AirWave for heat mapping. I helped with the San Francisco office configuration and setup, and completed the setup and configuration for the Eagan office.

Process and Deliverables

The office installations consisted of installing the WIC cards into the router, updating the router, switch, and steelhead software, configuring the equipment, testing the connection between router, switches and the steelhead, setting up the VPN tunnel, testing the 4G failover connection, and shipping the equipment for onsite installation.

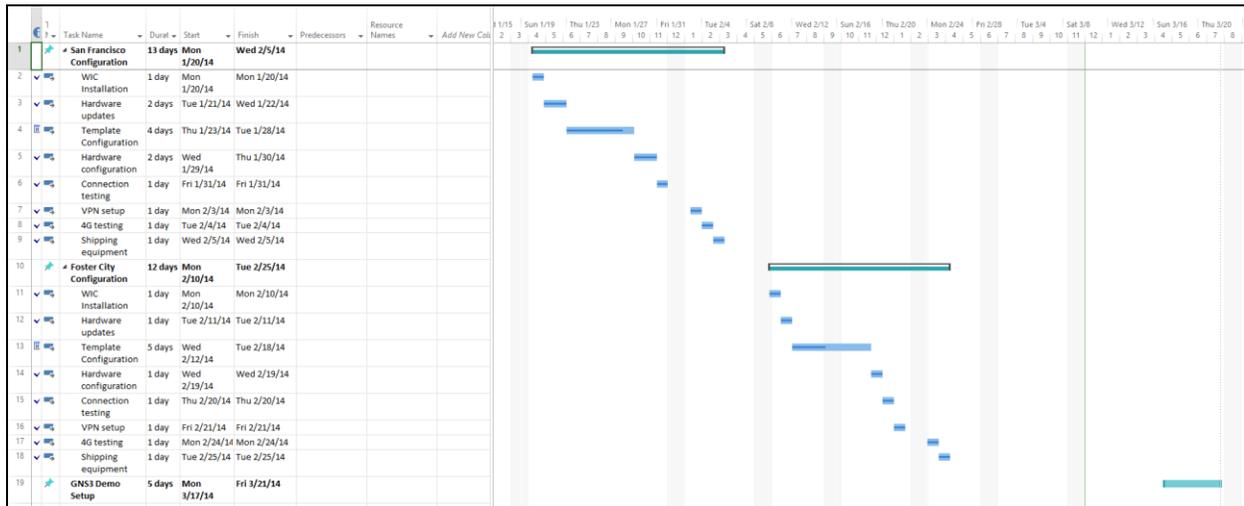


Figure 2. Gantt chart

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