Wired and Wireless Network Upgrade for St. Michael's Church

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Proposal Overview

Problem Summary

       Saint Michael's Church in Nice Beach, Florida, is a well-established non-profit religious entity, operating on a multi-building campus. They currently employ 20 people serving a religious community of 300+ members. Saint Michael's Church has acknowledged the value of using technology for its religious outreach ministry. The pastor described their need as essential and offered the following description. "St. Michaels offers two worship services, one featuring contemporary Christian music, and a second service offering traditional worship featuring our pipe organ. The Covid pandemic caused us to cancel in-person worship and explore alternative ways to offer services of worship to home-bound members. The Worship Committee decided to stream our weekly services. A volunteer hastily put together a system that included a modem and a cell phone. As the pandemic lifted and members returned, the committee

saw the need to continue streaming their worship. We now want to add a quality streaming service and

other technology to our outreach" (The Rev. Jack Black, St. Michaels Church). Their wish to add several

new technologically heavy endeavors such as streaming their church services on multiple internet

platforms and the creation of a church app for sermon notes and other relevant information, was

limited by the amount of bandwidth needed to perform these desired offerings. These cannot be

maintained by their outdated current network infrastructure. They are having issues with the live

stream and have received complaints about the new app being inaccessible. During the church service,

the live stream will completely stop for approximately 10 seconds because of the lack of internet

bandwidth that is required to stream video as well as provide guest Wi-Fi to members accessing the app.

This has led to the discontinuation of the church's streaming of live services, as well as limited

functionality on the app.

      The issue of internet bandwidth is also negatively affecting the daily administrative duties of the

employees who work in the back offices of the church. Many employees have voiced concerns that their

hard-wired internet connection which connects to each office desk, goes down daily in the middle of

critical business processes. They do have two Wi-Fi WLANs as backups, but the same issue occurs. This is

a huge problem because they need a reliable internet connection to perform accounting tasks, email

communication, and running background checks on volunteers and new employees. The head pastor

has revealed that their network infrastructure was implemented over 15 years ago with technology that

hasn't been updated since. This includes 2 Linksys XAC1900-ME Wireless Routers that provide the

current wireless connections, and outdated CAT 5 ethernet cables with a max bandwidth of 100mbps

that are the main type used for the wired connections that hook up to the individual desk offices. During

that initial implementation, long ethernet cables were run along the outside of each building and have

become damaged due to weather. Because churches are nonprofit organizations, St. Michael's is on a

limited budget and relies on grants and donations to cover operating expenses.

IT Solution

Saint Michael's has decided to hire GenNet LLC to analyze and update their existing wired and wireless network. The proposed IT solution will involve updating the existing routers with one super-charged Cisco Catalyst 8200L Router. This Cisco router runs on the latest Cisco operating system, Cisco IOS ® XE, and makes use of Cisco's DNA Center Cloud-Based Dashboard which centralizes the management of the network. This will make it easy for the current IT individual to manage the entire location's wired and wireless infrastructure. GenNet will also install four new Catalyst IW9167EH Heavy Duty Access Points in optimal locations to provide seamless Wi-Fi access for hundreds of users throughout the location. These Access Points run on Cisco IOS ® XE operating system and can provide the latest 802.11ax (Wi-Fi 6) standard, which theoretically can supply up to 4.8 gigabits per second of Wi-Fi bandwidth.

One of the most important upgrades that needs to be addressed is the replacement of existing ethernet cabling throughout the location. This includes the legacy CAT5 (100mbps) cables connected to each employee's desk, but most importantly, the internet connection coming into the location from their Internet Service Provider (ISP). GenNet will work with the available ISPs in the area to procure a 10-Gigabit Ethernet (10GBASE-SR) fiber-optic solution, which provides the fastest and most reliable incoming internet connection for a very reasonable price. All other ethernet cabling will be replaced with the newer gigabit CAT6 (1GBASE-T) ethernet standard. With the new router and ethernet cable installation, a two new Cisco Catalyst 1300 Series Switches will also be needed to disperse and segment internet traffic to appropriate areas within the location.

These hard deliverables mentioned above represent a complete IT solution for solving all of Saint Michael's internet issues. They will have enough bandwidth to livestream services, provide their members with easy access to the new app, and ensure the employees can carry out their basic administrative functions. GenNet will also assist the organization in applying for a grant that is offered

by Cisco for nonprofit entities. A grant can help offset some of the initial expenses required to complete this necessary network upgrade.

Implementation Plan

1. Meet with appropriate stakeholders to verify what they truly want to accomplish within their location in regard to the wired and wireless network. In this phase, GenNet will also guide them in applying for a nonprofit grant through Cisco as a soft deliverable.

2. Once the project scope has been thoroughly agreed upon, our team will review and run tests of the current network configuration to identify the root cause of the poor internet connection (i.e. Bottlenecks, outdated firmware, etc.). This survey will include an analysis of the current LAN, WAN and Wireless physical connections, as well as a review of their current Internet Provider plan. The outcome of this phase will produce a complete map of the network and its capabilities, which in turn will be used to determine the necessary upgrades of legacy equipment within the network infrastructure.

3. With a completed network map of capabilities and problem areas in hand, GenNet will purchase the necessary upgraded equipment and work with Saint Michael's internet service provider to ensure their internet package will provide the required fiber-optic speed necessary to meet the demand.

4. While we wait for the network hardware to arrive from the supplier, the team will begin upgrading the wired network. This includes replacing the older CAT5 (100mbps) cables ethernet cables with the newer gigabit CAT6 (1GBASE-T) ethernet cables. These cables run from inside the main building, then outside for 50m to the office building. The team will weather-proof the cables with protective casings that are approved for use in humid climates such as Florida.

5. As the new networking equipment arrives from the supplier, the team will install and configure the router, the switches and the four access points.

6. Test the new network while simultaneously documenting the network topology.

Review of Other Works

When beginning any type of project with a new client or organization, a little research into the organization's culture can be of great value. Blindly entering into a project contract with a client in an industry that is foreign to you and your team, can drastically increase the time spent on the project. This St. Michael's network upgrade project is a nonprofit religious organization, which has some distinct differences when compared to a large enterprise for-profit company. Jason Davis, a Cisco Technical Engineer and leader of Cisco's Interfaith Network, offers an insightful description of how technology is used in a religious environment. He goes on to state that "a common artifact of houses of worship is not having technical staff" and that there's "a heavy reliance on volunteers to provide internet-based marketing such as a website" (Davis, 2021). Understanding these factors of the culture of a nonprofit religious organization, the GenNet team was able to recommend a feasible IT Solution Proposal to St. Michael's.

A major concern of St. Michael's Church and countless nonprofit organizations worldwide, is acquiring modern information and communication technologies. In the academic article *Understanding the Impact of Information Technology in Nonprofits: Insights From a Multi-Case Analysis*, Mehruz Kamal discusses these issues. Kamal addresses the needs and limitations of small non-profit organizations like St. Michaels Church in using technology to enhance their mission. He looked at how small organizations suffer from the phenomenon of the "digital divide" and observed how small nonprofit organizations continuously find themselves the wrong side of this socio-economic phenomenon. Kamal defines the concept of the "digital divide" as "the gap between demographics and regions that have access to

modern information and communication technologies and those that do not". The differences are found in regions such as rural vs. urban centers in the US, and between developed and non-developed countries worldwide (Kamal, 2020).

For the purposes of this paper, the digital divide can be seen between large for profits and smaller nonprofit organizations such as St. Michaels Church. Large for-profit corporations, considered on the "right side" of the digital divide, have the necessary means and finances to easily procure modern technology to meet and exceed their business needs. While smaller nonprofit organizations on the "wrong side" of this divide, lack the means to obtain modern information technology systems.

Over the last decade, there has been focused efforts to try and bridge the large gap that exists between the two sectors. Government agencies and large companies are driving this effort by providing nonprofit grants for smaller organizations which make the procuring of modern information technology systems more accessible. That being said, GenNet is assisting St. Michael's in obtaining a Cisco Nonprofit Grant to offset much of the upfront expenses for the equipment needed for the network upgrade.

Conducting a thorough and accurate site survey of the environment is a crucial first step when implementing a new wireless network. As stated in the Cisco technical document Understand Site Survey Guidelines for WLAN Deployment, "numerous problems can occur due to a poorly conducted site survey" (Patrick Croak, 2023). This Cisco technical document provides guidelines and best practices for conducting an effective site survey. The GenNet team used this technical document to plan, prepare and create the site survey of the wireless environment of St. Micheals. This document outlined several crucial points that attributed to a successful analysis. These primary points that assisted the GenNet team were: Understanding the Different Types of Site Surveys, Identifying Mistakes that Cause a Poor Survey, and common troubleshooting scenarios of wireless networks.

Cisco routers are at the networking gold standard and the heart of the wired and wireless network. This is why the only source for reviewing other works related to this project is Cisco's

"Hardware Installation Guide for Cisco Catalyst 8200 Series Edge Platforms". This guide details the proper installation and configuration from start to finish, as well as detailing the process of customizing the router to meet specific network requirements. The router has the capacity to add or remove various modules that allow the device to connect to whatever form of cable you are using in your network (Cisco Systems, 2021). Because the Catalyst 8200 Series router is the demarcation point that brings internet access into the network, every member of the team had a digital pdf copy readily available. This manual helped the GenNet team throughout the installation and configuration of this project.

Project Rationale

Saint Michael's church has been a local cornerstone for decades for the members of their small beach town community. Over the last 2 years, they have seen a decline in their church attendance and are scrambling to find new ways of increasing their membership. Like many churches, which are actual nonprofit organizations relying on a small staff and volunteers, they have found themselves "on the wrong side of the digital divide" and must adopt more modern ways of performing business processes (Kamal, 2020). The organization has not upgraded their network in previous years due to a lack of finances. This is why GenNet is assisting Saint Micheal's in applying for a nonprofit grant from Cisco.

In a today's world, online worship services can be seen broadcasting from every area of the globe. The benefits of upgrading the St. Michael's network are numerous and almost a necessity. A more robust network infrastructure would greatly enable the church's ministry to members and provide outreach through modern technological tools. These tools, coming in the form of live streams and smartphone applications create an environment that will enable staff and volunteers to promote growth.

Current Project Environment.

Saint Michael's Church is a well-established non-profit religious entity, operating on a multi-building campus. They currently employ 20 people and serves a religious community of 300+ members. At present, St. Michael's is using one Linksys XAC1900-ME Wireless Router in each of their two buildings as their complete Wi-Fi solution. The problem with this existing Wi-Fi solution is that the wireless routers do not provide the necessary coverage or enough bandwidth to support hundreds of people connecting while simultaneously live streaming over the internet. Fifteen years ago, two wireless routers would have been sufficient for their needs.

They currently print hundreds of worship service bulletins manually that are given to church members as they enter the building. This is a very time-consuming and expensive task for the church staff. This is why they want to use the smartphone application to streamline the process of providing worship bulletins directly on the app. At this time, they do not have the Wi-Fi capability to support hundreds of individuals logging on to the church's wireless network to access the app.

The other issue St. Micheal's is dealing with is the poor state of the hard-wired ethernet connection to employee workstations. These outdated CAT5 ethernet cables connect from the main wiring closet to each employee's desktop for internet access. Most employees are becoming frustrated because they cannot access their cloud software to complete simple business-related tasks. The poor state of these cables and configuration is negatively affecting critical business processes.

Upgrading the current environment of St. Michael's network is of the utmost urgency. The solutions are simple and described in more detail in the following comments. The two Wi-Fi routers are to be replaced with one new Cisco Catalyst 8200L Router and four new Catalyst IW9167EH Heavy Duty Access Points. The new router will be installed in the network closet located on northeast corner of the main building. Two Catalyst IW9167EH Access Points will be installed in each building in the most optimal location. These are capable of accepting over a thousand individual Wi-Fi connections and will

provide reliable Wi-Fi access for both staff and church members. To manage these access points, the

church staff simply logs into the cloud-based management dashboard of the new Catalyst 8200L Router,

Cisco DNA Center.

To address the issue of the current poor state of the hard-wired ethernet connection to

employee workstations; two Cisco Catalyst 1300 Series Switches will be ordered. One switch will be

placed in the wiring closet of the main building and then connected to the new router. The second

switch will be installed and configured in the second office building. This new Catalyst 1300 Series

Switch will provide 48 Power over Ethernet (PoE) switch ports that will be used to disperse and segment

internet bandwidth throughout the two buildings. This results in every employee having a reliable hard-

wired connection to complete their business tasks with ease.

Methodology

The ADDIE methodology would be best suited for a project of this magnitude. This methodology

includes five thorough phases as follows: Analysis, Design, Development, Implementation, and

Evaluation.

In the initial Analysis phase, the GenNet team will meet with St. Michael's management to

understand the overall goals of what they are trying to achieve and the requirements of these goals.

During this meeting, the problems hindering the organization from achieving its goals will be identified.

Vital information will also be collected regarding the size of the wireless coverage area within the

campus and the predicted number of individuals that would need to connect to the network. This

information will be used to determine the number of wireless access points needed. Points of contact

within the organization, as well as roles and responsibilities, will also be identified for project

collaboration.

Secondly, a thorough site survey of the existing network will be conducted during the Analysis Phase as well. First an equipment inventory list will be created containing device information and capabilities. Thirdly, each device will be mapped and documented to its physical locations using a current blueprint of the campus. The GenNet team will then commence running various network tests using network analyzers to identify problem areas within the network.

With the results from the Site Survey, which include a map of the current network and identified problems, the team will move into the Design Phase. In this phase, a list of new networking equipment that has been deemed worthy of the upgrade will be created. Then this list of new equipment will be integrated into the previously created network map blueprints. All of the current devices in the network will be removed from the network map and replaced by the new equipment in optimal locations, ensuring internet access that encompasses the required coverage area.

A project schedule and timeline spreadsheet will also be established in the Design Phase. This document will be used to provide a transparent direction and expectations for the GenNet team, as well as St. Michael's management.

This brings us to Phase 3 of the ADDIE methodology, the Development stage. In this stage, the team will order the new equipment that was found to meet the requirements per the previous stages. While awaiting the arrival of the upgraded equipment, the team will commence with upgrading of the old CAT5 ethernet cables that run in and between the two buildings, with the newer CAT6 ethernet cables. This step is of great importance because these cables connect to each employee's workstation in the adjacent office building. This wired solution is the primary method used to provide internet connectivity for daily business processes. During this upgrade, the new ethernet cables will be placed into a protective PVC tube and buried 2 feet underground. This protects the cables from the humidity and UV light degradation that is common in the state of Florida.

Communications with St. Michael's current Internet Service Provider (ISP) will begin in this phase to procure a fiber-optic internet package that provides the necessary internet speed for the upgrade. Once the new contract has been established with the ISP, the team will await the scheduled installation of the fiber-optic internet connection from the ISP.

The real work truly begins in the Implementation Phase of the ADDIE methodology. Phase 4 begins as soon as the new equipment arrives, and the Internet Service Provider has installed the new fiber-optic internet connection. The GenNet team will then remove all the old equipment and begin installing the new equipment. First, the new Cisco Catalyst 8200L Router will be installed in the network closet located on the northeast corner of the main building. In the same closet, one of the new Cisco Catalyst 1300 Series Switches will be installed and then connected to the new router. While the second switch will be installed and configured in the second office building. Next, all the new ethernet cables that run between the buildings, will be connected to the two new switches to provide internet access to the office building. Finally, the four new Catalyst IW9167EH Heavy Duty Access Points will be installed in the optimal locations specified in the network map. The new router, switches and access points are easily controlled and configured from a cloud-based management solution, Cisco DNA Center.

After installing and configuring the new network devices, the team will finally be ready to move to the fifth and final Evaluation stage. GenNet will meet with the entire St. Micheal's staff to simulate the network conditions that would be expected during their actual worship service. During this drill, the GenNet team will test and verify the newly configured network devices to ensure optimal performance. If any issues arise during this drill, or if anything was overlooked by the GenNet team, these items will be promptly troubleshooted and remediated.

Immediately following the simulation drill, the team will make sure the Network Topology Map accurately reflects the newly implemented network. Multiple copies of this network map will be given to St. Michael's management and GenNet's contact information will be made readily available for any

future questions. Lastly, GenNet will provide any last-minute guidance regarding the nonprofit grant

from Cisco.

Project Goals, Objectives, and Deliverables

Goals, Objectives, and Deliverables Table

	Goal	Supporting objectives	Deliverables enabling the project objectives
1	Upgrade St. Michael's wired and wireless network	1.a. Meet with management to gather the proper scope of their network needs.	1.a.i. An ordered list, based on importance level, which documents the current and desired business processes on the network.
			1.a. ii. A clear understanding of the obstacles that are hindering their desired outcomes.
			1.a.iii. Identify the maximum number of individual devices that would need to connect to the network.
			1.a. iv. Gain approval to communicate with and make executive decisions with the current Internet Service Provider (ISP).
			1.a.v. Provide a professional consultation regarding necessary steps to acquire Cisco's Nonprofit Grant.
		1.b. Conduct a complete site survey of existing network.	1.b.i. Create an inventory list containing current device information and capabilities
			1.b. ii. Generate a current network topology map of the entire campus.
			1.b.iii. Provide root cause analysis reports identifying problem areas within the network.
			1.b. iv. Create a new inventory list of necessary equipment and a proposed new network map.
			1.b.v. Develop a project schedule and timeline spreadsheet
		1.c. Prepare existing environment for upgraded network equipment	1.c.i. Upgrade the internet package from Internet Service Provider to one that will provide necessary bandwidth (a fiber-optic connection).
			1.c. ii. Replace old CAT5 ethernet cables with new CAT6 ethernet cables

		1.d. Order, install and setup upgraded network equipment	1.d.i. Router installed and setup for network connectivity.
			1.d. ii. Switch installed, configured, and connected to router.
			1.d.iii. Access Points placed in location and setup to receive Wi-Fi signal from the router.
		1.e. Confirm and document the proper functionality and future maintenance of network.	1.e.i. Conduct network simulation drill confirming proper network upgrade.
			1.e. ii. Updated Network Topology Map and Tutorials Laminated Document established and provided to the client.
			1.e.iii. Cisco Grant status revisited to address last minute concerns.

Goals, Objectives, and Deliverables Descriptions

The one encompassing goal of this project is to provide fast reliable internet connectivity to the St. Michael's Church location. The upgrading of the wired and wireless network infrastructure will drastically help the staff conduct daily business processes in a timely fashion. It will also help the church meet their goal to make use of modern online technologies for their religious outreach ministry. The creation of the new church mobile app, which members use for worship service notes, is overloading their outdated wireless network. The following objectives represent a complete IT solution to this goal:

- Objective 1a: Gaining a clear understanding of the overall project scope by meeting with St. Michael's management team. During this initial meeting, GenNet will ask probing questions to discover the organization's goals and what they hope to accomplish with their network. Daily critical and non-critical business tasks must be identified along with an approximate number of devices that need to be on the network at any given time. This objective's success is measured by the agreement on and signing and of a work contract that approves GenNet to proper authorization to commence with any tests and make any decisions deemed necessary to meet the network upgrade requirements.

- o Deliverable 1.a.i: Obtain an ordered list from management, based on importance level, which documents the current and desired business processes on the network.

- o Deliverable 1.a.ii: Document obstacles identified by management that are hindering their desired outcomes.

- o Deliverable 1.a.iii: Identify the maximum number of individual devices that would need to connect to the network.

- o Deliverable 1.a.iv: Management approval to communicate with and make executive decisions with the current Internet Service Provider (ISP).

- o Deliverable 1.a.v: Address the organization's budget concerns by providing guidance and professional advice on acquiring a Cisco Nonprofit Grant.

- Objective 1b: Conduct a Site Survey to gather intelligence of the physical location and the current state of the existing network. This is a major step that dictates every subsequent step moving forward by establishing a starting point. The successful completion of this objective will be accomplished only after creating several detailed inventory lists and network reports, as well as a comprehensive networking testing has been conducted.

- o Deliverable 1.b.i: Creating an inventory list containing current device information and capabilities will help make informed decisions for replacement equipment.

- o Deliverable 1.b.ii: Generate a current network topology map of the entire campus of every device identified in the inventory list. These blueprints will also contain building diagrams used for proper hardware placement.

- o   Deliverable 1.b.iii: From the information gathered in the inventory list and

    network map, The GenNet team will run various network tests, identify problem

    areas, and create root cause analysis reports.

- o   Deliverable 1.b.iv: Using the root cause analysis reports, a new inventory list and

    network map will be generated of the new equipment found to be necessary.

- o   Deliverable 1.b.v: Having at this point established a clear direction forward,

    roles and responsibilities amongst the GenNet team will be assigned. A project

    schedule and timeline spreadsheet will be agreed upon, which brings

    transparency and expectation to the project as a whole.

- Objective 1.c: The preparation of the environment in anticipation for the network

    upgrade. There is going to be a bit of overlap between this objective 1.c (environment

    prep) and objective 1.d's (ordering of new equipment) as the new network hardware

    will be ordered in conjunction with the preparation of the St. Michael's environment.

    This is due to the long stretch of days required for the new equipment to arrive. During

    that time, communications with St. Michael's Internet Provider as well as ethernet cable

    upgrades will begin. Here, objective success purely determined by the placement and

    procurement of upgraded network wiring.

    - o   Deliverable 1.c.i: An upgraded a fiber-optic internet package contract from the

        ISP will be obtained to provide the necessary bandwidth speed of the incoming

        internet connection. This is a lightning-fast and surprisingly cost-effective

        solution if one considers the time to be just as important as cost.

    - o   Deliverable 1.c.ii: Replacement of old CAT5 ethernet cables with new CAT6

        ethernet cables. This deliverable represents the most labor-intensive task of the

        entire project. A trench will be dug in between the two buildings on the campus

to a depth of 2 feet by 1 foot in width. The new ethernet cables will be placed into a protective PVC tube and buried under ground. This helps to protect the cables from the outside elements.

- Objective 1.d: Ordering and installing the upgraded network equipment. As previously stated, the equipment was already ordered and has now finally been delivered to the St. Michael's location. Using the updated Network Map, created in Deliverable 1.b.iv, the installation and setup of the new equipment is meticulously executed by the GenNet team. This objective will meet its successful end when all new networking devices have been placed in their proper locations identified in the Network Map.

  o Deliverable 1.d.i: The new Cisco Catalyst 8200L Router will be installed in the network closet located on northeast corner of the main building. This location was found to be the optimal location for providing ample internet coverage for the entire campus. Configuration and setup of the router will occur here as well.

  o Deliverable 1.d.ii: The two new Cisco Catalyst 1300 Series Switches are to be installed and configured by the team. One switch will be placed in the wiring closet of the main building and then connected to the new router. The second switch will be installed and configured in the second office building. These upgraded switches provide more than enough individual ethernet ports to implement EtherChannel redundant connections between the two buildings. EtherChannel is a networking concept that makes two or more ethernet cables function as a single, logical connection. This provides increased bandwidth and will establish cable redundancy between the two buildings. Redundancy creates multiple paths between devices in a network and acts as a safety-measure in

case one of the physical links fails. If failure occurs, traffic will automatically be

rerouted through the remaining link.

- o Deliverable 1.d.iii: New Access Points will be placed in optimal location and

  setup to receive Wi-Fi signal from the router. These access points will enable St.

  Michael's to reach their goal of providing reliable access to their new mobile

  church app. These access points will be properly placed and tested to ensure

  sufficient internet connectivity for their hundreds of members to connect to the

  app from their smartphones during worship services.

- Objective 1.e: As the project enters the final stage of the project, the GenNet team will

  confirm proper network functionality and update all network-related documents for

  future maintenance. The measure of this final objective's success will be gauged on the

  completion of the following deliverables:

  - o Deliverable 1.e.i: The GenNet team will announce an "All hands-on deck"

    meeting with the entire St. Micheal's staff for a simulated network drill. This drill

    will replicate the exact network conditions that would be expected during their

    actual worship service. This allows for an accurate evaluation of the finished

    product by the GenNet team and exposes the St. Micheal's management and

    staff to their new upgraded network.

  - o Deliverable 1.e.ii: The simulated drill will provide any last-minute changes to be

    added to the Updated Network Topology Map and Tutorials Laminated

    Document (aka Network Cheat Sheet), which will be finalized and distributed to

    the client for the purpose of maintaining and troubleshooting their new

    network.

o Deliverable 1.e.iii: The GenNet team will revisit the Cisco Grant status to address last minute concerns in pertaining to the grant.

Project Timeline with Milestones

Milestone or deliverable	Duration (hours or days)	Projected start date	Anticipated end date
Initial scope gathering meeting with St. Michael's management	3 hours	6/18/2024	6/18/2024
Creation of list documenting current and desired business processes	2 hours	6/18/2024	6/18/2024
Identify the maximum number of individual devices that would need to connect to the network	1 hour	6/18/2024	6/18/2024
Gain approval to make changes to the current Internet Provider contract	1 hour	6/18/2024	6/18/2024
Provide Nonprofit Grant consultation	1 hour	6/18/2024	6/18/2024
Create an inventory list of current device info and capabilities	3 hours	6/19/2024	6/19/2024
Generate a current network topology map of the entire campus	4 hours	6/19/2024	6/19/2024
Provide root cause analysis reports identifying problem areas within the network	4.5 hours	6/20/2024	6/20/2024
Create a new inventory list of necessary equipment and a	3 hours	6/20/2024	6/20/2024

proposed new network map			
Develop a project schedule and timeline spreadsheet	2 hours	6/21/2024	6/21/2024
Order and receive new equipment from manufacturer	5 days	6/21/2024	6/26/2024
Upgrade current internet provider package and await scheduled fiber-optic installation	4 days	6/21/2024	6/25/2024
Replace old ethernet cables with new ethernet cables	2 days	6/22/2024	6/26/2024
Internet provider installs the upgraded fiber optic connection	1 day	6/25/2024	6/25/2024
New upgraded equipment arrives at St. Micheal's from the manufacturer	1 day	6/26/2024	6/26/2024
Router installed and setup for network connectivity	3 hours	6/26/2024	6/26/2024
Switch installed, configured, and connected to router	3 hours	6/26/2024	6/26/2024
Access Points placed in location and setup to receive Wi-Fi signal from the router	1 day	6/28/2024	6/28/2024
Conduct network simulation drill confirming proper network upgrade	1 day	6/29/2024	6/29/2024
Updated Network Topology Map and Tutorials Laminated Document established and provided to the client	4 hours	6/30/2024	6/30/2024

Cisco Grant status revisited to address last minute concerns	1 hour	6/30/2024	6/30/2024

Outcome

The wired and wireless network upgrade for St. Michael's Church is going to enable the nonprofit to continue and expand their outreach ministry. This modern and robust network design will be capable of live streaming their multiple worship services online with exceptional visual/audio quality and none of those embarrassing 10+ second disconnects. With the addition of the four new heavy duty access points, the campus can now allow for hundreds of individual Wi-Fi connections from members connecting to the St. Micheal's Mobile Church App for quick access to worship materials, events and the online donation portal. Just the providing of digital worship materials alone, will save the church thousands of dollars annually by not printing these worship notes on paper at a mass scale. As for the staff who attend to the daily critical and non-critical business tasks, the issue of the poor wired internet connectivity in their office building will be but a distant memory. The replacement of the outdated and weather-worn ethernet cables, backed by GenNet's 100% guarantee, will ensure that no business process will ever be held-up again. In fact, St. Michael's management may even have to increase the staff to keep up with the rapid growth due to the efficiency and speed at which business tasks can be performed. GenNet's 100% satisfaction guarantee, will ensure the continued business relationship with St. Michael's and our networking team. GenNet will monitor the state of the network for a 2-month period, to ensure the new robust network solution is consistently placing the organization in a position to thrive. This project will be classified a success when within this 2-month monitoring period, there are zero issues with the worship service live stream and all church members are able to connect to Wi-Fi to access the mobile app.

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