



ALPHA  
Network Technology

Barnes and Associates PC

# NETWORK SOLUTION



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## 1.Introduction

Greetings! Thank you for considering Alpha Networking Technology (ANT) for your company's operational needs. We understand you have many options to choose from when it comes to selecting a partner to fulfill your networking installation requirements and with that in mind we at ANT intend to offer your company a service and installation package unparalleled in value and quality. Incorporated in 1998, ANT has over two decades of experience helping small businesses such as yours create solutions to their technological problems. How have we managed to become the premier network firm in the Worcester county region? Without question it is due to the talented folks who make up Alpha Networking Technology! Our CEO, Linshuo Li, has extensive knowledge of the finance and accounting fields with particular attention paid to the strategic playing field. Our Project Manager, Jiaxin Lyu, takes pride in overseeing even the most complex client requests and seeing them come to fruition ahead of schedule and under budget! Our Network Architect, Madhushree Kulkarni, is an expert in the formation and design of network proposals. Her work for small businesses has achieved a harmony of simplicity, security and redundancy unmatched by her peers. Our CFO, Anuj Vyas, has advocated for clients by ensuring our network plans are completed with an eye towards economy. His motto is "we're here to help our customers. Not fleece them." Finally, we have our Sales & Customer Relationship Manager Brian Chase. Stated plainly, his job is to listen to clients, advise them on solutions and work with our service partners to see that their problems are solved to everyone's satisfaction.

To sum up, Alpha Networking Technology is a company that stands out amongst our competitors. We have an excellent track record of project success, our team members are first rate and you will be thrilled with our end product. We look forward to working with you.

## 2.Value Proposition

When searching for the right networking installation company for one's business, the many choices out there can seem to blend together. As an accounting firm, you shouldn't have stress about the world of servers, routers and wifi. And yet designing a network and getting it right the first time and for future needs is paramount. At ANT our value proposition to you is simple: peace of mind for today and flexibility for tomorrow. By peace of mind we want you to never have to worry that the product you have been provided for is a risk to your business. Your focus needs to be on running your company and not the computer systems that you work off of. Every step of the work we will do with you will be structured so every question is answered and no doubts remain in your mind about what we are doing.

By flexibility tomorrow, we understand that every business's future has not been set in stone. Where you want to take your company is a page yet to be written. Thus the design and

installation work to be done for you will have the characteristics of flexibility and scalability at the forefront. We want the network we give you to grow with you instead of choking you off from such growth. These value propositions are how we do business and why your business should be done with us.

### **3. Customer References**

As the old adage goes, talk is cheap. Any run of the mill IT company can make promises and guarantee quality. But it's rare that a firm can put their money where their mouth is. At Alpha Network Technology we are in the enviable position to broadcast the many rave reviews we have received from former and current clients. With their recommendations, we showcase that our promises are not hot air. For example, Brad Shad, CEO of Shrewsbury Accounting LLC, was a former client in need of network security help. After successfully implementing an improved network system, he wrote "(these guys rock. Now, instead of spending time on tech infrastructure, company wide anti-virus and malware software, and network issues, I can now focus on growing my business. Thank you, Alpha Technology!" Another former client, Donald Drake of Holden Financial, was looking to expand into the cloud. After working with us he wrote "ANT handled all of our company IT needs including; support, cloud based ops and baseline security. I highly recommend their services. Great service at a reasonable cost." One current client, Lu Han, CIO of Webster Hedge Fund Services, is very grateful for the ongoing assistance we provide for his network architecture. He wrote "what amazes me about ANT is how quickly they respond to their customer's needs. This business is staffed by the brightest and most professional people I have ever encountered from an IT company. I have recommended them to a few business colleagues and they have been as impressed as I am." One last recommendation for inclusion by a current client is by Justin Briber, the Network Security Officer for Worcester State Bank. He writes "Linshuo and the rest of the staff at ANT are the best! They are incredibly professional, knowledgeable, and trustworthy. I use Alpha for all of my computer and networking needs." This is just a small snapshot of our satisfied customers. With nearly twenty years of working with financial firms in the Worcester we have a tremendous list of clients who we have assisted and would be happy to sing our praises. All you have to do is ask.

## 4. Barnes & Associates Business Analysis

### 4.1 Industry Analysis

#### 4.1.1 Introduction

Companies in accounting service industry provide services such as audit and assurance services, tax preparation and compliance work, consulting assistance, restructuring and other accounting-related services. The US accounting services industry includes about 133,000 establishments (single-location companies and units of multi-location companies) with combined annual revenue of about \$140 billion which contribute to global accounting services where total revenue is \$495.5 billion. With growth of the revenue, new accounting firms have entered the industry and competition has intensified. In order to expand market share, the industry's largest players have been conducting M&A strategy and making purchases to include more consulting services. Over the next five years, the Accounting Services industry is projected to grow at an annualized rate of 4.0% to \$126.3 billion.

#### 4.1.2 Threats to the Industry

**High Regulatory Complexity**— Accounting firms must fulfil numerous directives from government and industry groups.

**Litigation Risk** — Accounting firms are increasingly implicated in lawsuits regarding their clients' business reporting and operational results.

**Dependence on Skilled Personnel** — Accounting firms depend heavily on the reputation of the firm and finding skilled personnel.

**Complexity of Customer Needs** — Smaller accounting firms may have difficulty keeping up with the increasing needs of customers who expand into international trade, have operations in several states, or who are engaged in acquisitions.

**Competition from Do-it-Yourself Accounting** — Smaller accounting practices, especially sole practitioners, lose business to people who use commercially available software to do their own accounting.

#### 4.1.3 Current Technology

Technology has had an impressive but subtle impact on the accounting industry as a whole. Adoption of accounting software and databases has been widespread throughout firms and has resulted in significant boosts of productivity and accessibility. With the advent of remote working programs, staff is now able and encouraged to work from home and respond to client requests 24/7 which, in a globalized world, is a key selling point for employers. In addition, adoption of "cloud" orientated servers has resulted in staff being able to service far flung clients thus expanding their revenues. That said, technological use of apps and social media in the accounting sphere has had a dubious reception. The reasons for this are two-fold. The first is that of propriety. Accounting firms are keen on maintaining and exhibiting a professional

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outward appearance to their clients; both current and prospective. Populating Facebook with ads touting the benefits of their newest auditing ventures will likely fall flat when placed next to cat videos. The second is that of a target market. Most of the audience for apps and social media are geared towards casual use / younger users. That said, there is much promise for social media and apps for the future. Real time notifications to clients, strategic blog posts for industry outlets and inventive graphics for interested users are just some of the options possible. One underlying threat to all these technology items however is that of information security. The danger of private data being stolen, accounts being hacked and customer confidence being lost are a paramount threat to the integrity and survivability of an accounting company.

Business Intelligence is currently being widely used in accounting industry. BI involves developing processes and systems that collect, transform, cleanse and consolidate organization wide and external data (usually in an accessible store such as a data warehouse) for presentation on users' desks as reports, analysis or displayed on screens as dashboards or scorecards. New technologies are continuing to shape the future of accounting industry. Cloud computing is one element and would help accountants build a more strong connection with customers. Automating data entry would improve the working efficiency, data accuracy and data integrity. Artificial intelligence would make it possible for accountants to access real-time data or predict future data which could be used to generate more business insights.

## 4.2 Company analysis

### 4.2.1 Current Position in Industry

Barnes and Associates currently resides in something of a secure space for their business as per industry trends. The Worcester region is growing both economically and population wise and thus is a beneficiary of rising budget clout. And that clout results in more accounting work! At the same time, the Worcester region (and thus B&A) are small enough to be ignored by the Big Four accounting firms that straddle the accounting world. Companies such as KPMG are focused primarily on larger targets located in correspondingly larger cities such as Boston and thus are not direct competitors. Impacts from technology have been buffeted by the region's mature adoption speeds. However B&A should not rest easily within this cocoon of security. Digging deeper, the population rise in the Worcester region is being powered by retirees whose accounting needs are much lighter than that of younger entrepreneurs. B&A's "bread and butter" business will likely shrink. Even more disturbing is the likelihood of an acquisition or direct competition from one of the Big Four who, facing lower profit margins, seek to expand into areas and markets that they would have previously overlooked.

#### 4.2.2 Major competitors:

Major players(Nation-wide)	Major Players (Worcester)
Ernst & young LLP	Greenberg, Rosenblatt, Kull & Bitsoli P.C (GRK & B)
Deloitte Touché Tohmatsu	Goulet. Salvidio & Associates, P.C.
pricewaterhouseCoopers	O'Connor, Maloney, & Company
KPMG International	

#### 4.2.3 Business goals

- **Profitability**

As a for-profit organization, the most important business goal is to make a profit. B&A is supposed to increase its market share in Worcester Area

- **Increasing customer satisfaction**

In order to expand its business, B&A determines to leverage IT solutions to provide high-quality services for their customers to increase customer satisfaction.

#### 4.2.4 Technical goals

- **Securing data transfer process**

Since Barnes and Associates is an accounting company, it possesses important customer information and financial data. Therefore, they have to secure their data to avoid information leakage or data loss.

- **Improving network scalability, availability, performance and affordability**

A good network environment paves a solid foundation for company's normal operation. Both staffs and clients can have easy access to the network which is beneficial to business development.

#### 4.2.5 Business Constraints

- **Time constraints:** The construction of new location where B&A would be located at will start in March 2018, and be completed by October 2018. B&A plans to move in December 1, 2018.
- **Budget constraints:** Reasonable priced plan would be considered to be competitive.

- **Space constraints:** B&A will be housed in two story building with a first and second floor approximately 7,000 sq ft. in each floor, so the total area for storage and working is 14,000 sq ft. Space should be considered when hiring more people

## 5. Application Analysis

Since we are proposing a Network plan for B&A, we would recommend only software which would be cost effective and try to reduce the number of applications. For example, if the client buys the Microsoft office package then we would recommend Microsoft products itself that fulfill the need and are a part of the purchased software. The below table gives a list of applications that Barnes and Associates could use for their operations in their new space. It consists of different kind of services they may need in their work ranging from network management, communications tools and security tools.

### 5.1 Network Applications

Application Name	Description	Type
Cisco FindIT Network Management	Cisco FindIT Network Management is purpose-built for managing networks of Cisco 100 to 500 Series devices. It lets you proactively manage the network instead of just reacting to events.	Network management
Cisco 5512-X Next-Generation Firewall Services	Cisco ASA Next-Generation Firewall Services include Cisco Application Visibility and Control (AVC), Web Security Essentials (WSE), and Intrusion Prevention System (IPS). They blend a proven stateful inspection firewall with next-generation firewall capabilities and network-based security controls for end-to-end network intelligence and streamlined security operations.	Intrusion Prevention

Cisco Advanced Malware Protection	Cisco® Advanced Malware Protection (AMP) is a security solution that addresses the full lifecycle of the advanced malware problem. It not only prevents breaches but also gives you the visibility, context, and control to rapidly detect, contain, and remediate threats if they evade front-line defenses, all cost-effectively and without affecting operational efficiency.	Anti-Malware
Cisco AnyConnect	Cisco AnyConnect Empowers your employees to work from anywhere, on company laptops or personal mobile devices, at any time. AnyConnect simplifies secure endpoint access and provides the security necessary to help keep your organization safe and protected.	VPN, Endpoint security
Cisco Email Security	The Cisco Email Security Appliance is an email security gateway product. It is designed to detect and block a wide variety of email-borne threats, such as malware, spam and phishing attempts. Because so many of today's attacks occur through email messages, having an email security gateway has become a necessity for most organizations.	E-mail Security
Cisco Web Security Appliance (WSA)	The Cisco WSA simplifies security with a high-performance, dedicated appliance, and the Cisco Web Security Virtual Appliance (WSAV) lets businesses deploy web security quickly and easily, wherever and whenever it's needed.  The Cisco WSA was one of the first secure web gateways to combine leading protections to help organizations address the growing challenges of securing and controlling web traffic.	Web Security
<u>Cisco Firepower Management Center</u>	It provides complete and unified management over firewalls, application control, intrusion prevention, URL filtering, and advanced malware protection. Easily go from managing a firewall to controlling applications to investigating and remediating malware outbreaks.	Security Management

Cisco Umbrella	Cisco Umbrella is a cloud security platform that provides the first line of defense against threats on the internet wherever users go. Cisco Umbrella uses the internet's infrastructure to block malicious destinations before a connection is ever established. By delivering security from the cloud, not only do you save money, but we also provide more effective security.	Cloud security
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## 5.2 Data management applications

Application Name	Description	Type
Cisco Secure Data Center	The Cisco Secure Data Center for the Enterprise is a portfolio of solutions that provides design and implementation guidance for enterprises that want to deploy physical and virtualized workloads in their data centers to provide the best protection available to address today's advanced data security threats.	Data center security
AppDynamics	AppDynamics Create better digital experiences, faster with real-time performance monitoring. Up your velocity and keep teams focused on customer needs with our industry-leading business and application performance monitoring solutions.	Network and Data analytics

## 5.3 Collaboration and communication Applications

Application Name	Description	Type
Skype	Skype is a telecommunications application software product that specializes in providing video chat and voice calls between computers, tablets, mobile devices, the Xbox One console, and smartwatches via the Internet and to regular telephones.	Teleconferencing

Slack	Slack is a cloud-based set of team collaboration tools and services, founded by Stewart Butterfield. Slack began as an internal tool used by their company, Tiny Speck, in the development of Glitch, a now defunct online game.	Project management & collaboration
MS Office	Office Online is an online office suite offered by Microsoft, which allows users to create and edit files using lightweight, web browser-based versions of Microsoft Office apps: Word, Excel, PowerPoint, OneNote and Outlook. Microsoft Outlook is a personal information manager from Microsoft, available as a part of the Microsoft Office suite.	Text, Data processing, E-mail, etc.

#### 5.4 Server and Client Applications

Application Name	Description	Type
Microsoft Windows server 2016	Windows Server 2016 is a server operating system developed by Microsoft as part of the Windows NT family of operating systems, developed concurrently with Windows 10	Server
MySQL Server Enterprise	MySQL is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL). SQL is the most popular language for adding, accessing and managing content in a database. It is most noted for its quick processing, proven reliability, ease and flexibility of use.	Database Server
Microsoft Exchange server 2016	Microsoft Exchange Server is a mail server and calendaring server developed by Microsoft. It runs exclusively on Windows Server operating systems.	Mail Server

## 5.5 System Analysis

Every employee would require an access card to enter the premises and access both the floors of the building. Only key employees would have access, along with a secure pin number, to restricted areas like server rooms and physical file storage blocks. Each employee would have a login to access to the applications and again only a few to access the locked functions of the applications. The system admin head from the IT department and the high level employees would have access to the legacy systems and the servers where sensitive data would be stored. Access to computers remotely should not be given to all the employees since the transactions and documents involve sensitive data.

## 6. Network objectives

### 6.1 Scalability



**A. Floor Space** - As per the floor plan, on the bottom & top floor we have planned space in such a way that in the future when the company is thinking of expanding they can accommodate new hires. We have 2 empty rooms already constructed on the second floor. On the first floor we have space in front of the conference room, where the space is currently allocated as seating area.

**B. Data Storage** - Since all of the data and the applications are hosted on the cloud, moving or adding additional space or increasing the number of clients would not cause much disruption. We can ask for additional space going ahead and pay a higher storage fee to CISCO for use of their servers.

**C. Redundancy** - The servers that are stored locally can be replaced with high capacity storage to accommodate more data in less space. Also going ahead we can install high capacity rack servers to store more servers in less space.

## 6.2 Availability

# AVAILABILITY

Implementing available servers for your infrastructure not only increases the productivity but also reduces the risk of your network getting compromised. The network is constantly monitored and reduces the chances of a breach being ignored. Sometimes they can help cover the automatic failures. Our servers and applications would be available all the time to the staff as well as to the clients since our data is accessed from the cloud servers. With respect to downtimes those would be only when the cloud services plan for one. Cisco has a high reputation for producing & selling good quality products. All the Cisco products are easily available & scalable. Also we have provided backup plans for all the devices & the network by including redundancy in the network.

## 6.3 Redundancy



Network redundancy is an important part of the network infrastructure to ensure network availability in case of network failure. No company is in a position to take risks in case of network failures. We guarantee Barnes & Associates will be able to stay connected 24/7 by implementing following redundancy plans

### A. Devices

We have connected all the devices such as firewalls, gateways, routers, Layer2 & Layer3 switches, ethernet switches in the network. In case one of the devices fail the other set is right there to support.

## B. Servers

We would suggest Barnes & Associates keep all the data on the Cisco cloud which provides high availability & security. If in case the servers face downtime or there is a network failure then we have additional servers stored & maintained locally on premises. Those can be used to ensure business continuity.

### 6.4 Security



Since Barnes & Associates is an accounting firm, security is of the utmost importance. The business involves the handling of confidential data like social security numbers, W2 forms, pay stubs & other personal information. A substantial exchange of this data from the clients & the accountants takes place. We need to analyze the security risks, security requirements in the network in order to protect the data & maintain system integrity.

We plan to provide maximum protection towards our client's data using the firewalls & the DMZ (demilitarized zone) network for intruder protection.

#### A. DMZ (demilitarized zone) network

We plan to protect the network from untrusted exposure by placing the servers in the DMZ network. The DMZ acts a liaison between the LAN & the direct exposure namely the internet. It acts a logical subnetwork that separates the internal local area network (LAN) from other untrusted networks. Different sets of firewall rules for traffic between the Internet and the DMZ, the LAN and the DMZ, and the LAN and the Internet tightly control which ports and types of traffic are allowed into the DMZ from the Internet, limit connectivity to specific hosts in the internal network, and prevent unrequested connections.

#### B. Malware protection

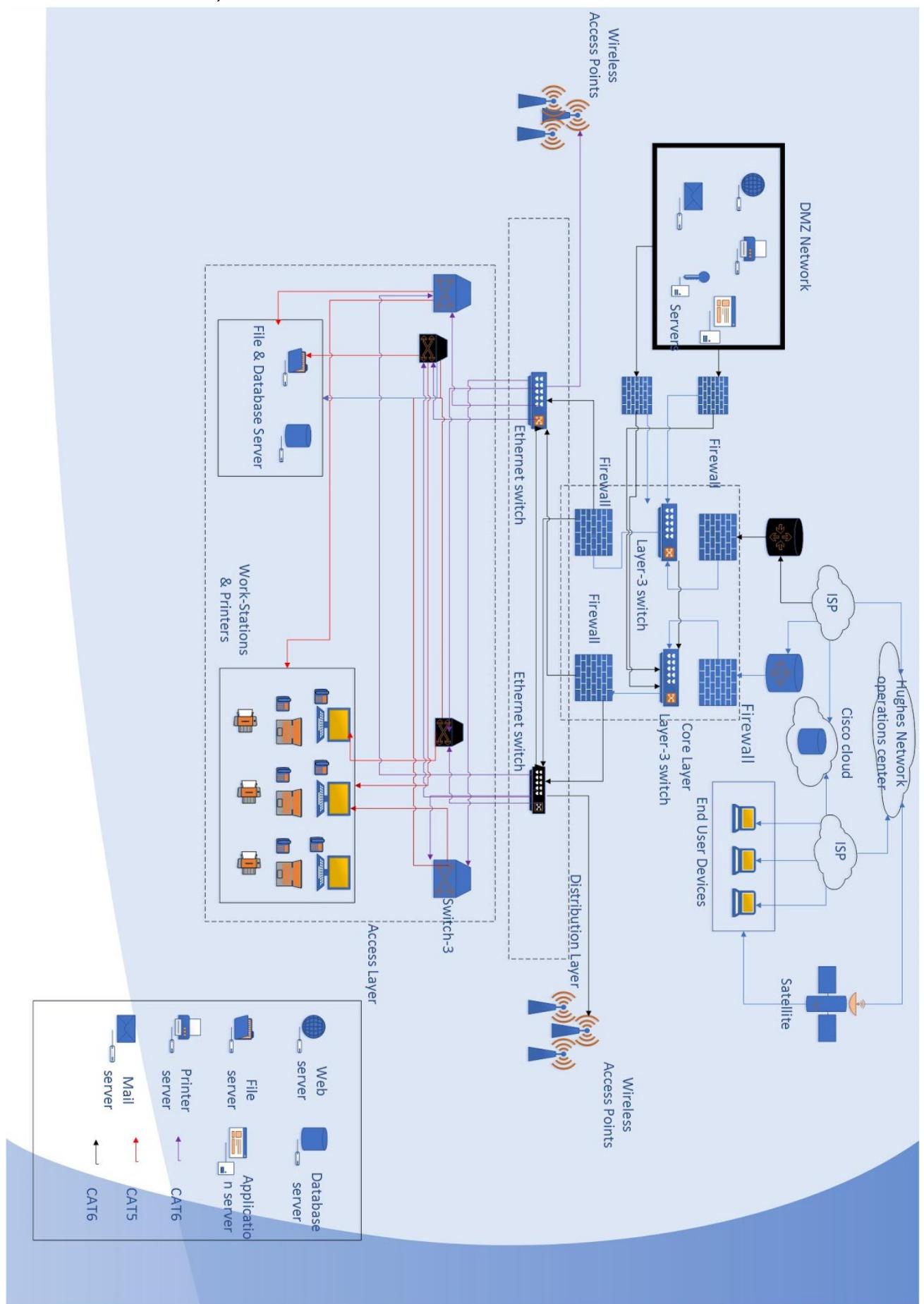
We urge Barnes & Associates to have Antivirus installed on the devices in tech network which act as virus protection bodies.

### C. Web security

We plan to implement CISCO web security software & hardware in the network to deal with security of web applications & websites.

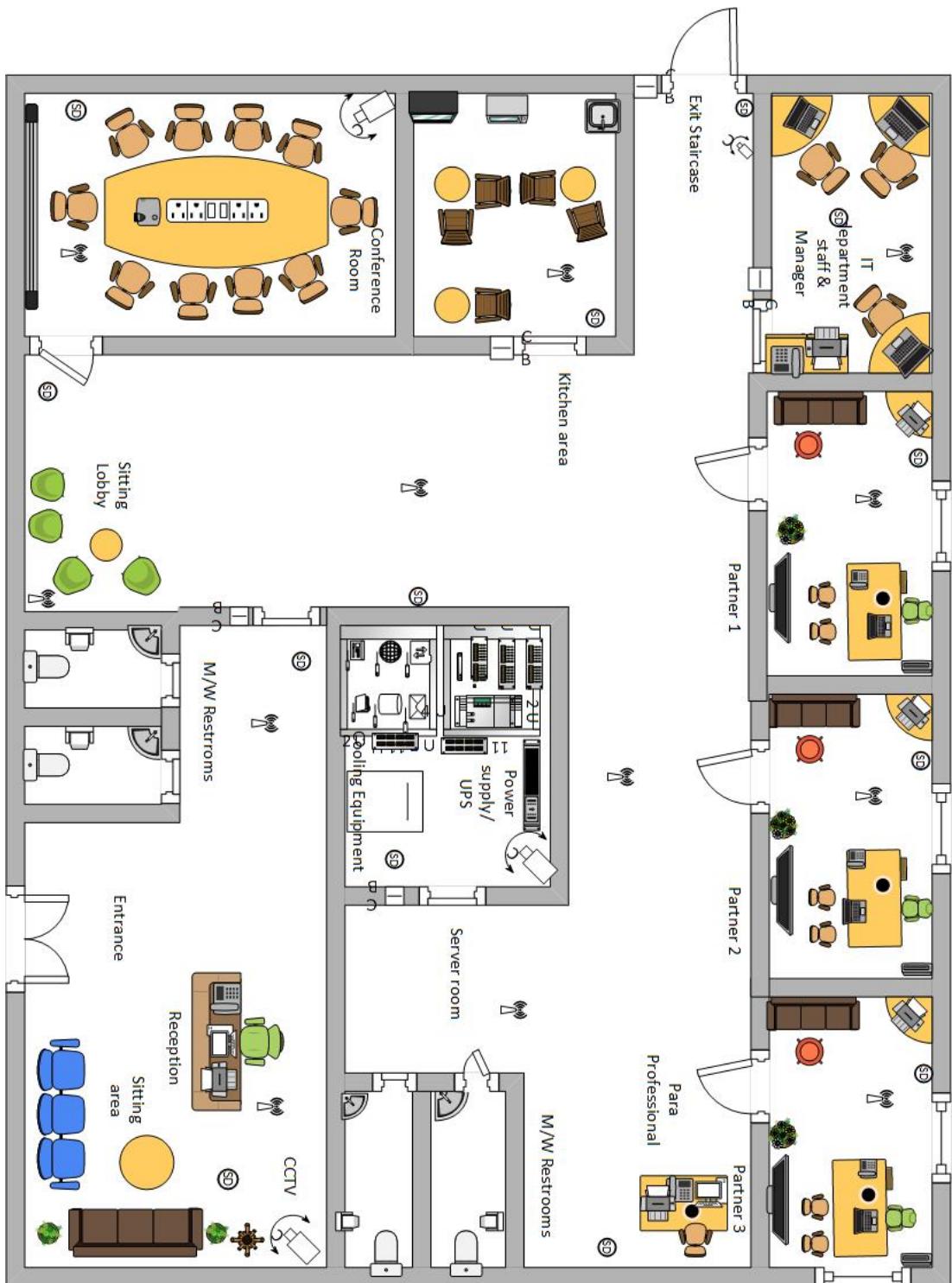
## 7. Network Design

This network diagram gives an overview of the Barnes and Associates Network. The network plan covers all the aspects alluded to in the needs analysis. The foremost need is to have a secure network in order to have a protected connection for the clients and the company. The network needs to ensure the data is completely secured and the firewalls are not easily intruded upon. Efforts need to be made to block hackers from infecting the devices in the network. Network security can be divided into access control, malware, application security, data loss prevention, email security, firewalls, intrusion prevention systems, wireless security, and web security. We plan to provide a secure network to protect from structured and unstructured security attacks.

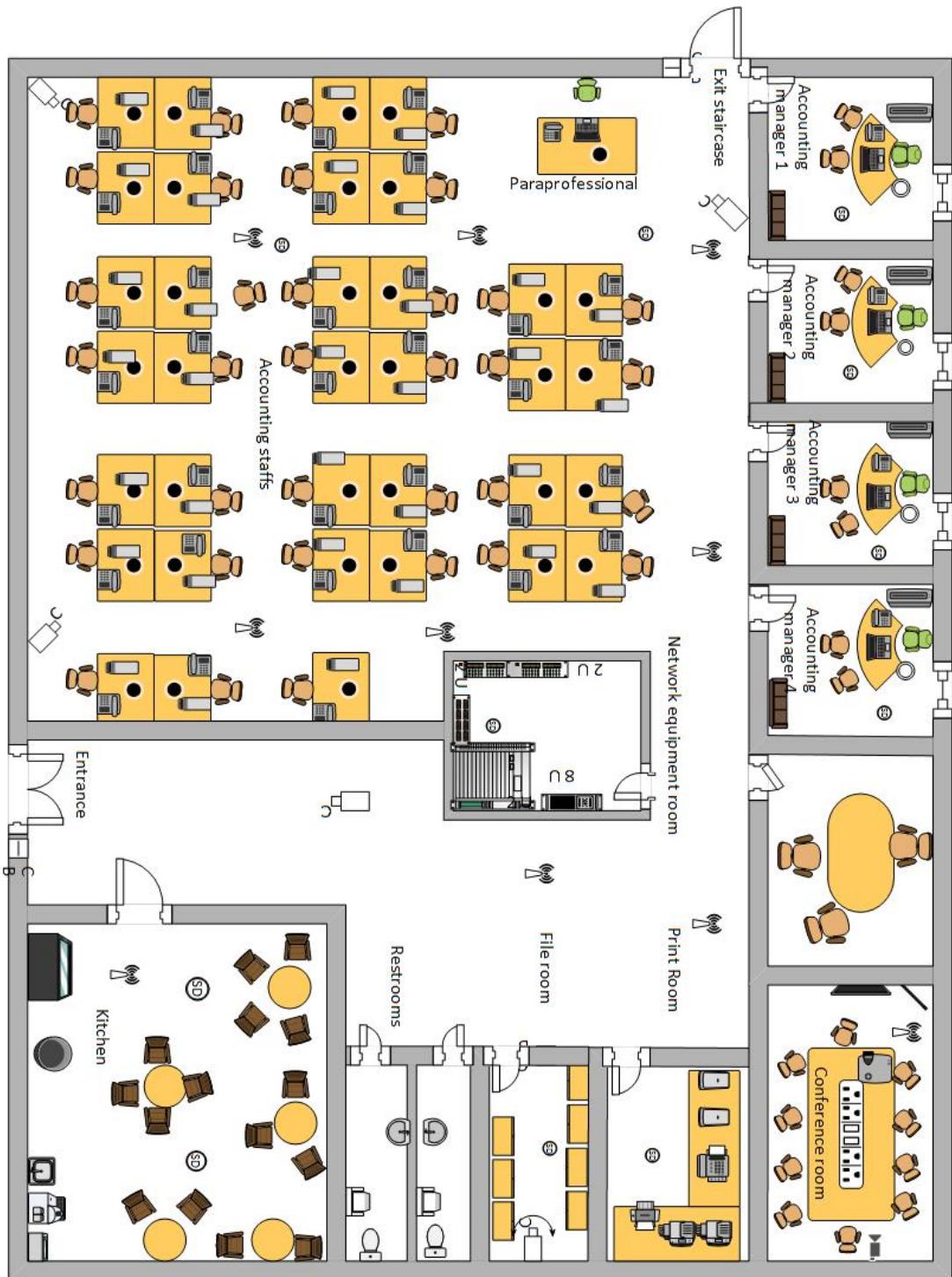


## 8. Floor Plans

### First Floor plan



## Second Floor plan



Sr.No	Employees	Count	Location
1	Receptionist	1	1st floor
2	Para-professional	1	1st floor
3	Partners	3	1st floor
4	IT Staff	2 approx	1st floor
5	Managers	4	2nd Floor
6	Accountants	35	2nd Floor
7	Para-professional	1	2nd Floor

Barnes & Associates has 2 floors with each being 7000 sq.ft. The 1st floor has the main entrance & a reception area along with a closed circuit surveillance. Each partner has an individual office on the same floor along with dedicated printers, document shredders & a projector screen. A paraprofessional is placed closed at hand to the partner's office. A kitchen area is built for clients & partners with all the basic amenities. A large conference room is equipped with a CCTV camera, projector, screen & patch panels for multiple connections. There is small sitting area just outside the conference room. We have allocated a small section for the IT staff which is planned to be recruited later on. Considering the space & future growth, we have designed the room in such a way to allocate four IT personnels with a common IP phone. A server room is placed on the same floor with racks, table, servers, switches, routers, patch panels & cooling equipment.

The server room is ID accessed only by IT staff, partners & managers. The server room contains all the data & web servers as a part of redundancy if the cloud access is down or lost. All the cabling to the switches, routers & access points are made from this room. Cables are ceiling & wall concealed with a view towards security. All the data is accessed from the Cisco cloud server & has redundancy stored on the on-premise servers as well.

On the second floor, space is allocated for the staff & managers. Each manager has their own office & 35 staff members have been allocated space along the bottom wall of the floor. A paraprofessional is placed right next to the manager's offices. This floor also has a kitchen area, conference room & storage room with cabinets to store files & documents. The file storage room is purposely placed on the second floor to become less accessible. The entire floor is covered with closed circuit surveillance as a security measure. There will be more access points in this section as the usage is more.

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Smoke detectors are mounted closely on each floor & fire extinguishers are placed in the exit staircase. Both the entrances of the floor are secured with ID card reader machines placed besides the door. The door near the reception area is separated from the working space by access IDs.

The company website is hosted on the Cisco cloud & can be accessed by the clients & the staff through logins. The clients can upload their data to the cloud & the staff can access & download the data through secure connections. Intruder protection and firewalls are placed on the network to avoid misuse of data as this data would contain sensitive information such as personal email IDs, contacts, Social security numbers, W2 forms etc.

As for the outlets and AC, we would recommend you to find building contractors for installing them. We will provide guidance on optimal locations for the installation of outlets and AC.

## 9. List of Components

S. No	Devices	Count	Explanation
1	VOIP phones	40	Phones will be available to every employee in the company to communicate within the company.
2	Ethernet Routing Switch	8	Will enable the functionality of routing the data packets and switching different components within the company.
3	Cisco Web Server	1	To store, process and deliver web pages to clients
4	Cisco Wireless Access Point	10	It will provide WI-FI to customers, to clients and to employees.
5	DMZ Network	1	To provide additional security to the company network.
6	Application Server	1	It will be used for running applications, handling transactions and making connection to the database.
7	CCTV (Camera)	7	For better security purpose within the company.
8	File Server	1	It will be used to store computer files (such as documents, sound files, photographs, movies, images, databases, etc.)
9	Print Server	1	Will be used for printing purpose.
10	Database server	1	It will be used for extracting the files in the database and processing them.

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11	Cisco Cloud services	1	It will be used to store data, to manage and maintain an IT infrastructure and will be also useful in data disaster recovery.
12	Mail server	1	To provide effective email communication within the company
13	Cisco Router	2	It will be used to connect the company network to internet through an internet service provider.
14	Ethernet cables	-	It will be used for connection of different components internally.
15	Firewall	4	It will be used to protect the network of the company from unauthenticated users and gives additional security.
16	HP Copier, printer and scanner	9	To make photocopies, printing and scanning documents.
17	Fax machine	10	Both fax and voice calls on the same telephone line

## 9.1 Device Details

### 1.Cisco Small Business SF500-24 ports:

The Cisco® 500 Series Stackable Managed Switches are a new line of stackable managed Ethernet switches that provide the advanced capabilities you need to support a more demanding network environment, at an affordable price. These switches provide 24 or 48 ports of Fast Ethernet and 24 to 52 ports of Gigabit Ethernet connectivity with optional 10 Gigabit uplinks, providing a solid foundation for your current business applications, as well as those you are planning. At the same time, these switches are easy to deploy and manage, without a large IT staff.



Cisco 500 Series switches are designed to protect your technology investment as your business grows. These switches provide the advanced feature set that growing businesses require, and that high-bandwidth applications and technologies demand.

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These switches can improve the availability of your critical applications, protect your business information, and optimize your network bandwidth to more effectively deliver information and support applications.

[https://www.cisco.com/c/en/us/products/collateral/switches/small-business-500-series-stackable-managed-switches/c78-695646\\_data\\_sheet.html](https://www.cisco.com/c/en/us/products/collateral/switches/small-business-500-series-stackable-managed-switches/c78-695646_data_sheet.html)

## **2. Cisco Small Business SPA 512G - VoIP phone:**

SPA 500 series phones offer enough features to serve everyone from manufacturing floor staff and cubicle workers to executives and remote employees. Your people stay productive, and enjoy access to voice and data communications wherever they are, but your costs stay low.



These affordably priced, reliable, and stylish IP phones are intuitive and easy-to-use. They also offer a rich user experience with wideband audio to connect employees and offices, application support to enhance productivity, and encryption for enhanced security. The SPA 500 series deliver a versatile array of features with investment protection to help your small business succeed.

[https://www.cisco.com/c/en/us/products/collateral/collaboration-endpoints/small-business-spa500-series-ip-phones/data\\_sheet\\_c78-548561.html](https://www.cisco.com/c/en/us/products/collateral/collaboration-endpoints/small-business-spa500-series-ip-phones/data_sheet_c78-548561.html)

## **3. Cisco Unified SIP Phone 3905 - VoIP phone:**

The Cisco Unified SIP Phone 3905 is a cost-effective, entry-level IP phone that addresses the need for basic voice communications with common Cisco Unified Communications features in an attractive design that is also budget-friendly. The phone can fill the communication needs of cubicle, retail, classroom, manufacturing floor and hallway, as well as various wall-mounted deployments.



The single-line Cisco Unified SIP Phone 3905 supports two calls per line. Fixed keys for redial, transfer, and hold/resume, along with a full-duplex speakerphone and two-line display, which comes standard, deliver a more productive, easier-to-use, and flexible endpoint experience. With its dual-port 10/100 Ethernet switch for network and PC connections, the Cisco Unified SIP Phone 3905 offers IT organizations a cost-effective solution to reduce cabling infrastructure and administration costs at the desktop. The phone is also eco-friendly, taking advantage of reground and recyclable plastics to deliver a more earth-responsible solution.

<https://www.cisco.com/c/en/us/products/collaboration-endpoints/unified-sip-phone-3905/index.html>

#### **4. Cisco Aironet 1702i Controller-based - wireless access point:**

The 1700 Series meets the growing requirements of wireless networks by delivering better performance than 802.11n and providing key RF management features for improved wireless experiences.



The 1700 Series supports 802.11ac Wave 1 standard capabilities. That includes a theoretical connection rate of up to 867 Mbps.

<https://www.cisco.com/c/en/us/products/collateral/wireless/aironet-1700-series/datasheet-c78-732347.html>

##### **5. Cisco Aironet 1542I - wireless access point:**



The Cisco Aironet 1540 series is ideal for applications, requiring rugged outdoor Wi-Fi coverage and supports the 802.11ac Wave 2 radio standard. Housed in a compact, aesthetically pleasing, easy-to-deploy package, the 1540 series offers flexible deployment solutions for service providers and enterprise networks, that need the fast links for mobile outdoor clients (smartphones, tablets and laptops) and wireless backhaul. The 1540 series access points give network operators the flexibility to balance their desired wireless coverage with their need for easy deployment.

<https://www.cisco.com/c/en/us/products/collateral/wireless/aironet-1540-series/datasheet-c78-738585.html>

## 6. Samsung Techwin WiseNet HD+ SCV-6083R - CCTV camera:

WiseNet HD+ IR outdoor vandal-resistant dome cameras allow users to upgrade their surveillance systems to HD using legacy coax cabling without the costly process of ripping and replacing coax with Ethernet cabling. The WiseNet HD+ cameras offer a variety of high-performance features including Day/Night operation, motion detection, defog, IR illuminators and more depending on model. Models include box, indoor dome, outdoor vandal dome, and outdoor bullet. Setup functions are easily controlled by OSD with the built-in joystick or control over coaxial cable with WiseNet HD+ DVRs. Low power consumption, compact form factors, and transmission up to 1,640 feet further enhance the lineup.

<https://www.cdw.com/shop/products/Samsung-Techwin-WiseNet-HD-SCV-6083R-CCTV-camera/4126849.aspx?pfm=srh>

## 7. Cisco UCS SmartPlay Select C240 M4S:



Enjoy this UCS C240 M4 rack server, that can be directly connected to UCS 6200 fabric interconnects for a higher I/O, UCS manager integrated solution, and can still connect via the N2232PP FEX. This Cisco UCS C240 M4 SFF server offer comes with extensive memory, powerful processor, and multiple drives in a 2U form factor.

<https://www.cdw.com/shop/products/Cisco-UCS-SmartPlay-Select-C240-M4S-Standard-3-rack-mountable-Xeon-E5-2/4220566.aspx>

## 8.Cisco ISR 2911



The platforms are architected to enable the next phase of branch-office evolution, providing rich media collaboration and virtualization to the branch while maximizing operational cost savings. The integrated services routers generation 2 platforms are future-enabled with multi-core CPUs, support for high capacity DSPs (Digital Signal Processors) for future enhanced video capabilities, high powered service modules with improved availability, Gigabit Ethernet switching with enhanced POE, and energy monitoring and control capabilities while enhancing overall system performance. Overall, the Cisco 2900 series offer unparalleled total cost of ownership savings and network agility through the intelligent integration of market leading security, unified communications, wireless, and application services.

<https://www.cisco.com/c/en/us/products/routers/2911-integrated-services-router-isr/index.html>

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## 9. Cisco Meraki MX100



The Meraki MX100 is a cloud-managed network security appliance designed to make distributed networks fast, secure, and easy to manage. Packed with next generation firewall and performance features like traffic shaping, VPN and WAN optimization, MX100 is ideal for reducing overall IT cost while enhancing network reliability. By leveraging the power of Meraki's Enterprise Cloud Controller Dashboard, the MX100 provides centralized visibility, control and security to your entire network. Designed for midsize / large branches with limited IT resources, the MX100 deploys in minutes without specialized training or certifications and unifies multiple appliances and management systems simplifying distributed network management.

<https://www.cdw.com/shop/products/Cisco-Meraki-MX100-Firewall/3182648.aspx>

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## 10. HP LaserJet Pro M402DNE



Printing performance and robust security built for how you work. This capable printer finishes jobs faster and delivers comprehensive security to guard against threats. Original HP Toner cartridges with JetIntelligence give you more pages.

<https://www.cdw.com/shop/products/HP-LaserJet-Pro-M402DNE-299-100-savings199-11-30/4282696.aspx>

## 11. HP Color LaserJet Pro MFP M477fnw



Unmatched print, scan, copy, and fax performance plus robust, comprehensive security for how you work. This color MFP finishes key tasks faster and guards against threats. Original HP Toner cartridges with JetIntelligence produce more pages.

<https://www.cdw.com/shop/products/HP-Color-LaserJet-Pro-MFP-M477fnw/3827422.aspx>

## 12. APC Smart-UPS



Smart-UPS On-Line provides high density, true double-conversion on-line power protection for servers, voice / data networks, medical labs, and light industrial applications. Capable of supporting loads from 1 to 20kVA in a rack/tower convertible form, the Smart-UPS On-Line is available from 2U to 12U. Recent family extensions at 15 and 20kVA enable support of power hungry blade servers or heavily loaded equipment racks. When business-critical systems require runtime in hours, not minutes, Smart-UPS On-Line can be configured with matching battery packs to comply with aggressive runtime demands. The included PowerChute management software provides unattended graceful shutdown of network operating systems. All models 5kVA and above include an integrated Network Management Card for remote management (optional on models below 5 kVA). The Smart-UPS On-Line family provides customers with a reliable source of uninterruptible power even in demanding power environments, including very wide input voltage window, extremely tight output voltage regulation, frequency regulation, internal bypass, and input power factor correction.

[http://www.dell.com/en-us/shop/accessories/apd/a8163066?ref=p13n\\_ena\\_pdp\\_vv&c=us&cs=04&l=en&s=bsd](http://www.dell.com/en-us/shop/accessories/apd/a8163066?ref=p13n_ena_pdp_vv&c=us&cs=04&l=en&s=bsd)

### 13. Generac Protector Series 30kW



- True Power technology delivers power quality with less than 5 percent total harmonic distortion for clean, smooth operation of sensitive electronics and appliances
- Evolution controller features a multilingual, two-line LCD text display with color-coded, backlit buttons equipped with an external viewing window for quick status check of the generator
- Thanks to Quiet-Test, your Protector generator runs its weekly self-test at a lower 3600 RPM, consuming less fuel and giving both the engine and alternator a longer life
- Connected to your home's existing liquid propane or natural gas fuel supply, it kicks in automatically within seconds of determining power loss
- Standard aluminum, all-weather enclosure provides corrosion resistance to prolong the life of your generator and is recommended for salt-air, coastal locations
- Consumer-friendly customer care hours to answer calls about the product
- 5-year limited warranty

[https://www.lowes.com/pd/Generac-Protector-45000-Watt-Lp-45000-Watt-Ng-Standby-Generator/50415216?cm\\_mmc=SCE\\_PLA\\_ONLY--SeasonalOutdoorLiving--SosGenerators--50415216:Generac&CAWEAID=&kpid=50415216&CAGPSPN=pla&k\\_clickID=64416f70-583e-4915-8efc-0f5841550e7c&gclid=Cj0KCQiAjO\\_QBRC4ARIsAD2FsXP6G-U4uj\\_A7XBMWFIDw61eGCYCMxHz94GpbzvEQj-UJEKa1j3MScaAju-EALw\\_wcB](https://www.lowes.com/pd/Generac-Protector-45000-Watt-Lp-45000-Watt-Ng-Standby-Generator/50415216?cm_mmc=SCE_PLA_ONLY--SeasonalOutdoorLiving--SosGenerators--50415216:Generac&CAWEAID=&kpid=50415216&CAGPSPN=pla&k_clickID=64416f70-583e-4915-8efc-0f5841550e7c&gclid=Cj0KCQiAjO_QBRC4ARIsAD2FsXP6G-U4uj_A7XBMWFIDw61eGCYCMxHz94GpbzvEQj-UJEKa1j3MScaAju-EALw_wcB)

## 14. Open Rack 22OU - 48OU

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- 42" of physical depth will easily fit in existing data centers
- Rack Units: 22OU,42OU,48OU
- Static load 3000 lbs
- Configurable for up to 3 bus bars
- Robust steel frame

<https://www.racksolutions.com/openframe-opencompute-project-rack.html>

## 15. APC InRow SC Air Cooled



- Automatic restart
- Scalable Architecture
- Easy to install
- Active response controls
- Fault-tolerant fan system
- Field replaceable components
- Dry contact output
- Horizontal airflow pattern

<http://www.dell.com/en-us/work/shop/accessories/apd/a0732088/overview>

## 10. Baseline Budget

### 10.1 Hardware Costs

Name	Description	Price (In dollars)	Quantity	Total Price (in dollars)
Cisco Small Business SF500	Switch	449	10	3592
Cisco Small Business SPA 512G	VoIP phone	145.99	15	1459.9
Cisco Unified SIP Phone 3905	VoIP phone	86.99	45	3479.6
Cisco Aironet 1702i	Access point	469.99	20	9399.9
Cisco UCS® C220 M5	Rack Server	4311.99	2	8623.98
Samsung Techwin WiseNet HD+ SCV-6083R	CCTV	163.99	10	1311.92
Cisco UCS SmartPlay Select C240 M4S	Application Server	3628.99	3	7257.98
Cisco ISR 2911	Routers	3199.9	2	6399.8
Cisco Meraki MX100	Firewalls	3581.99	6	21491.94
HP LaserJet Pro M402DNE	Printers	199.99	10	1999.9
HP Color LaserJet Pro MFP M477fnw	Copier, scanner and fax machine	399	2	798
APC Smart-UPS	UPS	4499	2	8998
Generac Protector Series 30kW	Generator	13999	1	13999
Open Rack 22OU - 48OU	Racks	199	6	1194
APC InRow SC Air Cooled	Cooling system	6599	2	13198
Cisco file server	file server	2467	3	4934
APC patch panel	patch panels	178.99	20	1789.9
Security Network RFID Access Control Board Kit	Security card access	292	8	2336
FM 200	Fire suppression system	12000	2	24000
Dell XPS 100	Notebook PC	799	50	39950
Fortigate 200a-hd DMZ Wan Network Firewall	DMZ network	70	1	70
HP Jetdirect 300x Print Server	print server	149.99	2	149.99
Cisco IronPort Email Security Appliance	mail security	2831	1	2831
			<b>Total costs</b>	<b>239875.89</b>

### 10.2 Networking Costs

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Application Name	Type	Unit Price	Count	Total Price
Cisco FindIT Network Management	Network management	781.99	1	781.99
Cisco 5512-X Next-Generation Firewall Services	Intrusion Prevention	677.99	6	677.99
Cisco Advanced Malware Protection	Anti-Malware	12.7	50	635
Cisco AnyConnect	VPN, Endpoint security	709.99	2	1419.98
Cisco Email Security	E-mail Security	21.99	1	21.99
Cisco Web Security Appliance (WSA)	Web Security	41.32	50	2066
Cisco Firepower Management Center	Security Management	1354	1	1354
Cisco Umbrella	Cloud security	65.99	5	329.95
			<b>Total costs</b>	<b>10679.85</b>

### 10.3 Communication and collaboration costs

Application Name	Type	Unit Price	Count	Total Price
Skpe	Teleconferencing	0	50	0
Slack	Project management & collaboration	0	50	0
MS Office	Text, Data processing, E-mail, etc.	200	50	10000
			<b>Total costs</b>	<b>10000</b>

### 10.4 Data management software cost

Application Name	Type	Unit Price	Count	Total Price
Cisco Secure Data Center	Data center security	1500	1	1500
AppDynamics	Network and Data analytics	998	1	998
			<b>Total cost</b>	<b>2498</b>

### 10.5 Server and client software

Application Name	Type	Unit Price	Count	Total Price
Microsoft Windows server 2016	Server	500	1	500
MySQL Server Enterprise	Database Server	1200	1	1200

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Microsoft Exchange server 2016	Mail Server	1500	1	1500
			<b>Total costs</b>	<b>3200</b>

For implementation costs, we charge on average \$100 to \$120 dollars per hour per worker. This variation is due to each network design's unique characteristics. Depending on how the network is put together is one factor but our company can negotiate different rates on a case by case basis. Flexibility is not restricted to the network itself!

## 11. Additional Service

At Advanced Network Technology, we stand behind our work. Our expertise, our use of the highest quality networking products and our dedication to customer service is unsurpassed. But we also know that every client is different. The needs and expectations of every customer are unique. Taking a one-size-fits all approach is doomed to disappointment. That is why at ANT we offer a series of add on options for consumers outside of our network installation focus. We believe that by partnering with ancillary service providers as well as providing specialized consulting services we can meet even the most exacting demands of our clients. In addition our partnering enables ANT to offer clients reduced rates not available to the general public as well as incorporating these services into the network design itself. One add on option we offer is that of satellite connectivity. Via the HughesNet satellite system, a client can maintain a connection to the Internet as well as cell service if and when earth based services are disconnected. For companies that demand uninterrupted service, HughesNet acts as a perfectly sensible redundancy choice. The system works by sending your Internet activity from your computer to a satellite about 22,000 miles out in space where it maintains a geosynchronous orbit. The satellite sends a signal to a HughesNet operations center on the ground which in turn locates the webpage you were looking for. From there the journey is reversed back to your computer. The distance in the work is far but the time delay is barely noticeable. The price for installing, maintaining and subscribing to the Internet / cell service from Hughes ranges in from price 5mb for \$49 to 25mb for \$125. When partnering with our company, we can get you a better price and can customize its operation to the network we design! Another add on option is that of network insurance. As proud as we are of our network security systems, we must admit no protection system is impregnable. Be it a disgruntled employee, a determined hacker or stolen equipment, the means by which your network can be breached are a fact of life. Expecting the worst and hoping for the best is the appropriate mindset to establish but is not an acceptable reaction for a business. The news is replete with companies suffering millions of dollars in losses to say nothing of having their name dragged through the mud! Thus we have partnered with the Alliance Insurance Company (AIC) to provide policies for our clients regarding these threats. These policies can provide personalized coverage per our network installation as well as the defined needs of the client and on a budget that ensures their peace of mind. As with HughesNet, our partnership with AIC can mean a lower asking price for you. A third add on option we offer is that of consulting services. Every business that is thinking of expanding is going to be facing a number of tough questions. Difficult choices will be ever

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present while the consequences of the wrong selection being severe. We can guide your company on a safe and educated path. With our nearly twenty years of experience under our belts there are few situations we have not had to deal with. As the originators of your network system we will be uniquely situated to scale up with a minimum of distress. As a company well aware of your past we will be able to formulate answers to your questions rapidly aided by trust and respect. Our hourly rates can open to negotiation depending on the work to be discussed and what best fits your budget! We are here to see you succeed!

## **12. Acceptable use policy**

### **12.1 Purpose**

The network resources at Barnes and Associates PC support audit and assurance services, tax preparation and compliance work, consulting assistance, restructuring and other accounting-related services of the accounting firms and the use of these resources is a privilege that is extended to faculty of Barnes and Associates PC. As a user of these services and facilities, you have access to valuable financial resources, to sensitive data, and to internal and external networks. Consequently, it is important for you to behave in a responsible, ethical, and legal manner.

In general, acceptable use means respecting the rights of other computer users, the integrity of the physical facilities and all pertinent license and contractual agreements. If an individual is found to be in violation of the Acceptable Use Policy, the Company will take disciplinary action, including the restriction and possible loss of network privileges. A serious violation could result in more serious consequences, up to and including suspension or termination from the Company. Individuals are also subject to federal, state and local laws governing many interactions that occur on the Internet. These policies and laws are subject to change as state and federal laws develop and change.

### **12.2 Scope**

This policy applies to all users of computing resources owned or managed by Barnes and Associates PC. Individuals covered by the policy include (but are not limited to) by Barnes and Associates PC faculty and visiting faculty, staff, guests or agents of the administration, external individuals and organizations accessing network services via company's computing facilities.

Computing resources include all company owned, licensed, or managed hardware and software, and use of the university network via a physical or wireless connection, regardless of the ownership of the computer or device connected to the network.

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## **12.3 Policy**

### **12.3.1 Acceptable Use**

- You may use only the computers, computer accounts, and computer files for which you have authorization.
- You may not use another individual's account, or attempt to capture or guess other user's' passwords.
- The company is bound by its contractual and license agreements respecting certain third party resources; you are expected to comply with all such agreements when using such resources.
- You should make a reasonable effort to protect your passwords and to secure resources against unauthorized use or access.
- You must not attempt to access restricted portions of the network, an operating system, security software or other administrative applications without appropriate authorization by the system owner or administrator.

### **12.3.2 Adherence with Federal, State, and Local Laws**

- Abide by all federal, state, and local laws.
- Abide by all applicable copyright laws and licenses. Barnes and Associates PC has entered into legal agreements or contracts for many of our software and network resources which require each individual using them to comply with those agreements.
- Observe the copyright law as it applies to music, videos, games, images, texts and other media in both personal use and in production of electronic information. The ease with which electronic materials can be copied, modified and sent over the Internet makes electronic materials extremely vulnerable to unauthorized access, invasion of privacy and copyright infringement.
- Do not use, copy, or distribute copyrighted works (including but not limited to Web page graphics, sound files, film clips, trademarks, software and logos) unless you have a legal right to use, copy, distribute, or otherwise exploit the copyrighted work. Doing so may provide the basis for disciplinary action, civil litigation and criminal prosecution.

### **13. Company Contact Information**

Being available to our clients is of the utmost importance to our team. We want you to know that there will never be a moment you can't be in touch with a live representative from Alpha Networking Technology. No matter the time of day, we will be on the other end of the line assisting you and your company through every hazard. ANT has a plethora of means of connecting be it via phone, Skype, cell or email. Our contact info is as follows:

Email: ANT@us.com

Skype: ANTnetwork

Fax: (861) 500-7421

Company Phone: (562) 222-6431

Sales Phone: (202) 456-1111

24/7 Line: (508) 831-5433

For in person visits we are very accommodating and open. Our office is conveniently located in WPI's Campus Center right next to the Dunkin Donuts shop. The office has two conference rooms able to seat twenty people in each and contains a full complement of technology visualization tools. Of particular interest is that the conference rooms are equipped with state of the art network modeling software. We can create a network model right before your eyes! For additional security and privacy, there is a secure room available. Our official office hours are 9am to 5pm Monday through Friday. That said we are more than willing to keep the lights on to accommodate your schedule. It is important that our clients understand just how keen we are on making sure their needs are met on their terms. We take pride in being flexible and being understanding of our customer's time! Thank you and we look forward to serving you!