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Network System Implementation

marconi law, LLC.

Orlando, FL

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**Scope of Work**

**Project Title**

Local Area Network System Implementation for Marconi Law, LLC

# **Project Scope**

This project aims to design a network for Marconi Law. Upon entrance to the business there is a sitting area and a receptionist desk. The receptionist will have a work station (PC) and a VoIP phone. This law firm also has a break room which will have a WAP (Wireless Access Point) device for guest and employee’s connectivity as well as a TV for enjoyment. Next to the break room will consist of a newly built server room. The server room is essential to house all records and backups for clients and important files. The server room includes a Monitor, Database server, a 24-port switch and a router. An all in one printer is located in the hallway as well as another WAP. Behind the printers are 8 desk which are all equipped with laptops and a mobile phone. There is an extra one of each for backup or a new hire. Across from the cubicles are 2 offices which are equipped with a work station, VoIP phone, laptop, mobile phone and a TV. Across from the back office is the conference room with is equipped with a VoIP phone, WAP and a TV.

Throughout the building there will be CAT5 ethernet cabling which will be ran from the demarcation point which is in the server room to the router, switch and server. From the server room the cabling will be ran through the ceiling to each cubicle, to the breakroom WAP, to the hallway for the printer and WAP, to the conference room for the VoIP and WAP, to each office’s laptop, work station and VoIP and to the front receptionist area monitor and VoIP. There will be devices that will have a static IP address (Ip address will never change). These devices will be the printer, WAP, router, DHCP server and switch. All other devices Ip address will be dynamic.

All configurations for existing employees are already configured. All groups, folders and permissions are already set. (Please reference previous milestone video for tips on how to add groups, folder and set permissions). All computer devices are connected to the server for managing employees. This project will be completed by September 20th, 2020. The total cost for this project is $39,505.80. There is an annual 12-month maintenance and support contact. If any changes are needing to be made it will be out of this scope and will require a change request form and a new project to be implemented.

# **Network Objectives/Benefits**

**Cloud Security:** Built in breach resistance that helps repel attacks on your system. Additional layers of security detect and limit any suspicious activity that manages to penetrate your environment. Shielded

Virtual Machines is one of the newly features in Windows Server 2016. This enhances security helps meet regulatory and compliance objectives and protects your business.

**Scalability:** The network that is being set. Up for Marconi Law Firm is scalable. If new cubicles are added there are 24 ports on the switch that will connect new workstations. With the current implementation most devices can be connected to WAP leaving room for more ports to be used for desktop workstations and etc.

**Customizable Switch:** A managed switch is what is installed in your law firm. “Cisco managed switches are extremely popular as they provide more control. You can fully customize a managed switch to tailor your network. Managed switches offer the most flexibility and scalability.” Here is a link for further information regarding the switch I installed in your business. [Cisco SG350X-24 Port](https://www.cisco.com/c/en/us/support/switches/sg350x-24-24-port-gigabit-stackable-managed-switch/model.html).

**Wireless Access Point: “**The [Cisco Business 145AC](https://www.cisco.com/c/en/us/products/collateral/wireless/business-100-series-access-points/smb-01-bus-145ac-ap-ds-cte-en.html) Access Point brings a full slate of Cisco high-performance functionality to offices where wired and wireless devices are used”. This is perfect for you small business. A data rate of up to 867 Mbps on its 5-GHz radio. Increased wireless performance with greater access and higher-density networks.

**Cisco Business Mobile app:** The application which manages your access points simplifies challenges associated with wireless network deployment. From the app you can enable guest access. You can closely monitor network usage, traffic patterns and network throughput. This app is available on iPhone, iPad and Android devices.

# **Network Infrastructure Requirement**

3 – OptiPlex 7470 All in one (WorkStation)

10 – Surface Book 2 (Mobile Laptop)

1 – Brother MFC-L8900 Printer All in one

3 – Cisco Business 145AC WAP

1 – PowerEdge T40 Tower Server / Dell Monitor & Windows Server 2016 Standard

4 – Poly VVX 601 VoIP + NeuPo 48 Bolt Power Supply

1 – Cisco RV160 VPN Router

1 – Cisco SG350X-24 Stackable Managed Switch

10 – Apple iPhone 11

4 – Sony 32-inch TV

Cat5 Ethernet Cabling

# **IP Network Design Table**

|  |  |
| --- | --- |
| **Devices/Users** | **Ip Address \*Static /24 Subnet** |
| Dan Marconi | **Laptop:** 192.168.123.21 **Desktop:** 192.168.123.22 **VoIP:** 192.168.123.23 |
| Brian Smith | **Laptop:** 192.168.123.24 **Desktop:** 192.168.123.25 **VoIP:** 192.168.123.26 |
| Phil Jones | **Laptop:** 192.168.123.27 |
| Karen Stark | **Laptop:** 192.168.123.28 |
| Bill Shoemaker | **Laptop:** 192.168.123.29 |
| Lisa Brooks | **Laptop:** 192.168.123.30 |
| Terry Long | **Laptop:** 192.168.123.31 |
| Samuel Adams | **Laptop:** 192.168.123.32 |
| Mike Drums | **Laptop:** 192.168.123.33 |
| Evelyn Schultz | **Laptop:** 192.168.123.34 **VoIP:** 192.168.123.35 |
| Printer\* | 192.168.123.6 |
| WAP\* (Breakroom) | 192.168.123.7 |
| WAP\* (Hallway) | 192.168.123.8 |
| WAP\* (Conference) | 192.168.123.9 |
| Router\* | 192.168.123.3 |
| Server\* | 192.168.123.5 |
| Switch\* | 192.168.123.4 |
| VoIP (Conference) | 192.168.123.36 |
| Extra Laptop | 192.168.123.37 |
| \*Static Information | Ip addresses from 192.168.123.3 - 192.168.123.20 are only for static Ip address. |

# **Network Configuration & Procedural Checklist**

Install operating systems

Configure and document how you setup the following, and use the checklist for documentation

1. User accounts (10), list every user logon and password
2. Groups (3)
3. Folders and permissions
4. Etc.

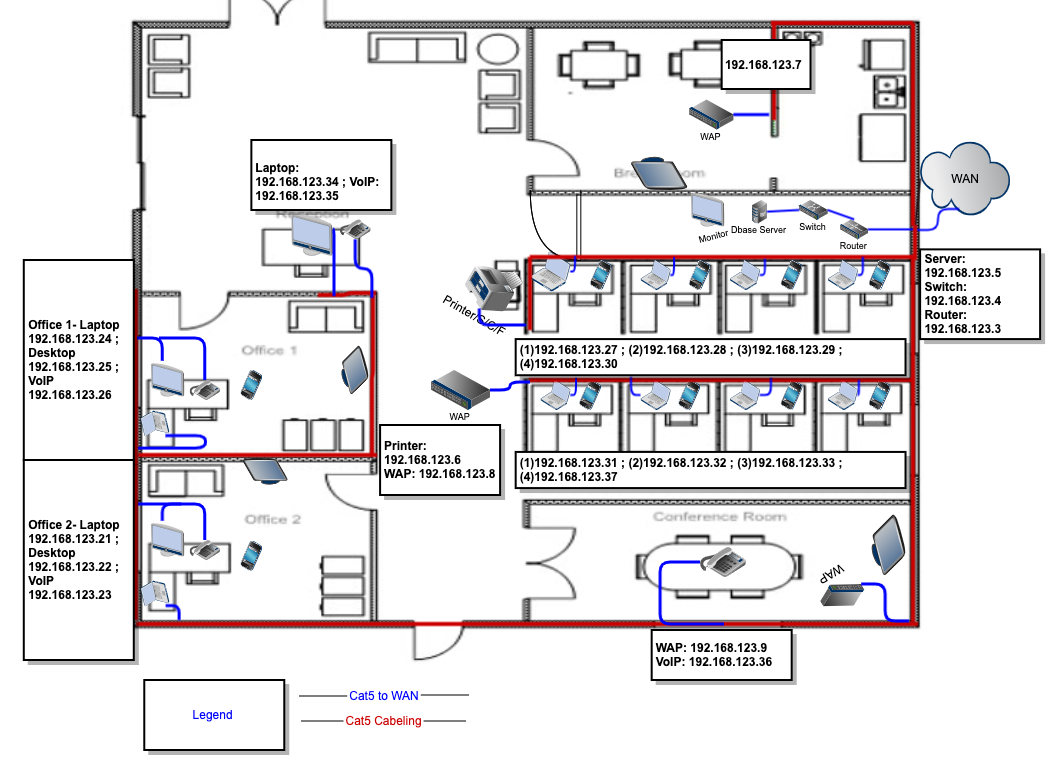
|  |  |
| --- | --- |
| **User Accounts** | **Procedures** |
|  | 1. Sign into Windows Server 2016 and Open Server Manager (Server Manager may automatically open) 2. Top right, Click on Tools 3. Click Active Directory Users and Computers 4. Click on Server name fscloud.local to be in the container 5. Click on File -> Action -> New -> User 6. Fill out user information \*User logon name is the name that the user enters when logging in. Click next. 7. Fill in temp password -> Select boxes that fits your security needs below. Click Next 8. Click Finish |
| **Groups** | 1. Sign into Windows Server 2016 and Open Server Manager (Server Manager may automatically open) 2. Top right, Click on Tools 3. Click Active Directory Users and Computers 4. Click on Server name fscloud.local to be in the container 5. Click on File -> Action -> New -> Group 6. Enter Group name. \*Keep below settings the same 7. Click OK. |
| **Folders & Permissions** | 1. Sign into Windows Server 2016 2. Open File Explorer (Can search if you need to find it) It is the folder icon on the taskbar. 3. Click on “This PC” -> Local Disk (C:) -> right click and hover over new and select folder \*This creates a new folder, if a folder is already created then skip this part. 4. Right click folder -> Share with -> Specific People 5. If you already know the user/user enter it in if not use the drop-down menu to click on “Find People”. -> enter name in empty box and click “Check Names” -> Once name is found click OK. 6. Make sure the correct Permission levels are given to that group or user.  * Read = Only can open file, not edit * Read/Write = Can open and edit file  1. Click Share |
| **Map Network Drives (Optional)**  **\*Mapping a network drive saves a few steps and time for users to access their network drive. Remember it is a good idea to always set permissions for certain users and groups so sensitive data will not be seen by other people that shouldn’t see it.** | 1. Make Sure Windows Server 2016 is running \*Should always be running 2. Sign into Windows Pro as a user 3. Open File Explorer (Can search if you need to find it) It is the folder icon on the taskbar. 4. Click on Network in left side panel 5. Use drop down and select server name [\\dcwinsrv16dh01](file://dcwinsrv16dh01) can be entered if needed. 6. Right click on any folder you want to map and select “Map network drive” 7. Enter Admin Credentials -> Username: administrator Password: Fullsail1! 8. Right click on the folder you want to map -> Click Map Network Drive -> Click Finish.   One the Network Drive is Mapped, then you can access it by going to This PC on the left side panel and the network drive is at the bottom under Network locations. You are able to make a shortcut and add it to your desktop for even quicker access.  You may get a warning saying network drive is not connected. Just double click to open and it will connect the drive. |

# **User Login and Password**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Title** | **Login** | **Password\*** |
| Dan Marconi | Director | D. Marconi | Lawfirm1! |
| Phil Jones | Attorney | P. Jones | Lawfirm1! |
| Karen Stark | Attorney | K. Stark | Lawfirm1! |
| Mike Drums | Attorney | M. Drums | Lawfirm1! |
| Bill Shoemaker | Attorney | B. Shoemaker | Lawfirm1! |
| Lisa Brooks | Attorney | Lisa Brooks | Lawfirm1! |
| Terry Long | Legal Assistant | T. Long | Lawfirm1! |
| Samuel Adams | Legal Assistant | S. Adams | Lawfirm1! |
| Brian Smith | Accountant | B. Smith | Lawfirm1! |
| Evelyn Schultz | Admin Assistant | E. Schultz | Lawfirm1! |

\*Please note that Passwords will need to be changed before user can log in completely.

# **Network Topology Diagram with IP Addresses**



# **Capital & Operating Requirements**

**Costs for this project**.

|  |  |  |  |
| --- | --- | --- | --- |
| Hardware | Per Unit Cost | Quantity | Total Cost |
| OptiPlex 7470 All in one | $929.00 | 3 | $2787 |
| Surface Book 2 | $1,150.00 | 10 | $11,500 |
| Brother MFC-L8900CDW | $524.99 | 1 | $524.99 |
| Cisco Business 145AC Series Access Point | $165.00 | 3 | $495 |
| PowerEdge T40 Tower Server / Dell Monitor & Windows Server 2016 Standard | $1368.98 | 1 | $1368.98 |
| Poly VVX 601 VoIP phone + NeuPo 48 Volt Power Supply | $179.99 | 4 | 719.96 |
| Cisco RV160 VPN Router | $149.00 | 1 | $149 |
| Cisco SG350X-24 Stackable Managed Switch | $490.37 | 1 | $490.37 |
| Apple iPhone 11 | $749.00 | 10 | $7490 |
| Sony 32 inch TV | $299.00 | 4 | $1196 |
| Labor (@ $75/hr.) | $75 | 10hrs 46 mins | $784.50 |
| Annual on-going network maintenance & support | $12,000 | 1 | $12,000 |
| TOTAL COST  \*All prices are before any taxes and fees. |  |  | **$39,505.80** |

# **Hardware & Software Specification**

**PC Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Dell |
| Model | **OptiPlex 7470** |
| Processor | **Intel ® Core ™ i5-9500 6 Cores** |
| Memory | **8GB** |
| Storage/Hard Drive | **500GB SATA** |
| Monitor | **H: 13.54”**  **W: 21.26”**  **D: 2.07”** |
| Ethernet | **RJ-45** |
| Operating System | **Windows 10 Pro** |
| Features | **Wireless**  **HDMI**  **USB 3.1**  **SD Card Reader**  **Headset Port** |

**Laptop Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Microsoft |
| Model | **Surface Book 2** |
| Processor | **7th Gen Intel Core i5** |
| Memory | **8GB** |
| Storage/Hard Drive | **256GB** |
| Monitor | **13.5 inches (Touch)** |
| Battery | **Up to 17 hours** |
| Operating System | **Windows** |
| Weight | **Total: 4.20 lbs.**  **Tablet: 1.80 lbs.** |

**Printer Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Brother |
| Model | **MFC-L8900CDW** |
| Functions | **Scan, Copy & Fax** |
| Weight | **63.1 lbs.** |
| Max Paper Capacity | **1,300** |
| Duty Cycle | **60,000 pages per month** |
| Memory | **512 MB** |
| Wireless | **Standard** |
| Platform Supported | **PC, Mac** |
| Physical Dimensions | **19.5” x 20.7” x 21.6”** |
| Manufacturer Warranty | **One Year** |

**Wireless Access Point Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Cisco |
| Model | **Business 145AC Access Point** |
| Features | **Increased wireless performance**  **Cisco Business Mobile App**  **Wired access**  **Mounting** |
| Maximum Clients | **200 per Wi-fi radio, total of 400 clients per access point** |
| Data Rates Supported | **802.11a, b/g, n and ac** |
| System | **1GB DRAM**  **256 MB flash**  **710-MHz quad-core processor** |
| Dimensions(without mount)(W x L x H) | **3.5 x 55 x 1.25 in.** |
| Weight with mount | **10oz** |

**Server Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Dell |
| Model | **PowerEdge T40** |
| Processor | **Intel Xeon E-2224G 3.5GHz** |
| Memory | **8GB** |
| Storage/Hard Drive | **1TB** |
| Monitor | **Dell 24” Full HD LED** |
| Ethernet | **RJ-45** |
| Operating System | **Windows Server 2019** |

**VoIP Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Poly |
| Model | **VVX 601** |
| Features | **4 soft keys to easy find transfer, conference and call park.** |
| Specifications | * 1. **LCD**   **Screen saver/digital picture frame mode**  **On-screen virtual keyboard**  **Voicemail**  **Dual USB**  **Bluetooth**  **Weight 2.0 lbs.** |
| Warranty | **1 Year** |

**Network Switch Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Cisco |
| Model | **SG350X-24** |
| No of Ports | **24** |
| Port speed | **24x 10/100/1000 ports** |
| CPU memory | **512 MB** |
| Power | **100 to 240V** |
| Encryption | **SSL**  **SSH** |
| Dimensions/Features | **Weight: 9.52 lbs.**  **Height: 1.73 in.**  **Operating Temp 32° - 122° F**  **Storage Temp -4° - 158° F**  **DoS Prevention**  **Private VLAN**  **DHCP snooping** |

**Router Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Cisco |
| Model | **RV160** |
| Speed | **600 Mbps** |
| Ethernet | **RJ-45** |
| Operating System | **Linux** |
| CPU | **Dual-Core** |
| Port | **4** |

**Mobile Phone Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Apple |
| Model | **Iphone 11** |
| Storage | **128GB** |
| Size and Weight | **H: 5.94 inches**  **W: 2.98 inches**  **D: 0.33 inch**  **Weight: 6.84 ounces** |
| Display | **6.1”** |
| Processor | **A13 Bionic chip** |
| Camera | **Dual 12MP Ultra-Wide and Wide cameras** |

**TV Information**

|  |  |
| --- | --- |
| Brand/Manufacturer | Sony |
| Model | **W600D** |
| Size and Weight | **S: 28.9 in x 3.5 in x 17.6 in**  **W: 10.8 lbs.** |
| Display | **1366 x 768** |

# **Cabling Information**

|  |  |
| --- | --- |
| CAT type | Cat5 |
| Features | **100MHz** |
| Length | **Max Length 100 meters** |