

Network System Implementation for the Marconi Law Firm, LLC.

Orlando, Florida

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Project Scope

- ❖ We have initiated this project for Marconi Law to help it develop and improve operational efficiency. Since beginnings in 2006, the company has grown from a small two-room office with limited staff and resources to a workforce of ten people. This expansion involves a more robust infrastructure to meet rising demand and better workflow. Upgrading their technical setup, optimizing office space, and installing new administrative systems would allow Marconi Law to maintain its high standards of service, optimize tasks, and better serve its customers in a competitive legal environment.
- ❖ The key objectives for Marconi Law include: - Centralize all operations in one area to improve efficiency and effectiveness.
 - Invest in a modern computer network infrastructure with scalability for future development.
 - Create and build a reliable, secure, and fast network infrastructure.
 - Ensure the seamless integration of new technology.
 - Provide full training to staff on the new systems.
 - Prepare for future growth by introducing scalable solutions.
 - Ensure that the infrastructure can meet rising demand to support the company's growth and profitability goals.
- ❖ Hardware List:
 - 1 router
 - 1 server
 - 1 switch
 - 10 computers with monitors (if needed)
 - 2 Wireless Access Points (WAPs)
 - 10 VoIP phones
 - 1 printer
 - 1 conference phone
 - 1 Smart TV for the conference room
- ❖ Software List:
 - Server software
 - Client computer software
- ❖ What's Not included:
 - Office furniture
 - Cloud-based services
 - Physical security systems
 - Additional Technical Support
- ❖ Marconi Law's project constraints include a limited budget, which requires careful resource allocation to guarantee that all key hardware and software components are purchased without overspending. Furthermore, there is a time restriction to effectively integrate the new network infrastructure while minimizing disturbance to ongoing activities. The project must also follow any regulatory and compliance standards related to legal procedures, including data security and confidentiality.
- ❖ Key Success Factors:

1. On-time Completion: The project is completed within the established timeline, minimizing disruption to the firm's operations.
2. Budget Adherence: The project stays within the allocated budget, ensuring cost-effectiveness without compromising on quality.
3. Seamless Integration: The new network system integrates smoothly with existing systems and processes, ensuring no loss of data or functionality.
4. Future Scalability: The infrastructure is designed to accommodate future growth and technological advancements, ensuring long-term viability.
5. User Training and Adoption: Comprehensive training is provided to all staff, ensuring they are proficient with the new systems and can utilize them effectively for increased productivity.

- This project will take about 5 weeks and will cost about \$60 000.

Network Objectives/Benefits

- Improved Communication: The new VoIP phones, wireless access points, and smart conference room technologies will improve communication both inside the workplace and with clients, allowing for improved cooperation and customer service.
- Scalability for Future Growth: Marconi Law's scalable network infrastructure will assist its future expansion by enabling for the easy integration of new resources and technology as the company grows.
- Enhanced Data Security: Upgraded server and software solutions will include strong security measures to secure sensitive customer information and comply with legal data standards.

IP Network Design Table

-	IP Address
Netmask	255.255.255.0
First IP	10.10.119.0
Last IP	10.10.119.255
Total Host	256
Network ID	10.10.119.0
Broadcast Address	10.10.119.255

Node	Hardware Name	Static IP address
1	Marconi Computer	10.10.119.20
2	Jones Computer	10.10.119.21
3	Stark Computer	10.10.119.22
4	Drums Computer	10.10.119.23
5	Shoemaker Computer	10.10.119.24
6	Brooks Computer	10.10.119.25
7	Long Computer	10.10.119.26
8	Adams Computer	10.10.119.27
9	Smith Computer	10.10.119.28
10	Schultz Computer	10.10.119.29
11	Marconi VoIP Phone	10.10.119.100
12	Jones VoIP Phone	10.10.119.101
13	Stark VoIP Phone	10.10.119.102
14	Drums VoIP Phone	10.10.119.103
15	Shoemaker VoIP Phone	10.10.119.104
16	Brooks VoIP Phone	10.10.119.105
17	Long VoIP Phone	10.10.119.106
18	Adams VoIP Phone	10.10.119.107
19	Smith VoIP Phone	10.10.119.108
20	Schultz VoIP Phone	10.10.119.109
21	Router	10.10.119.2
22	Server	10.10.119.3
23	Switch	10.10.119.4
24	WAP 1	10.10.119.5
25	WAP 2	10.10.119.6
26	Printer	10.10.119.7
27	Smart TV	10.10.119.9
28	Conference Phone	10.10.119.200

Network Configuration Process

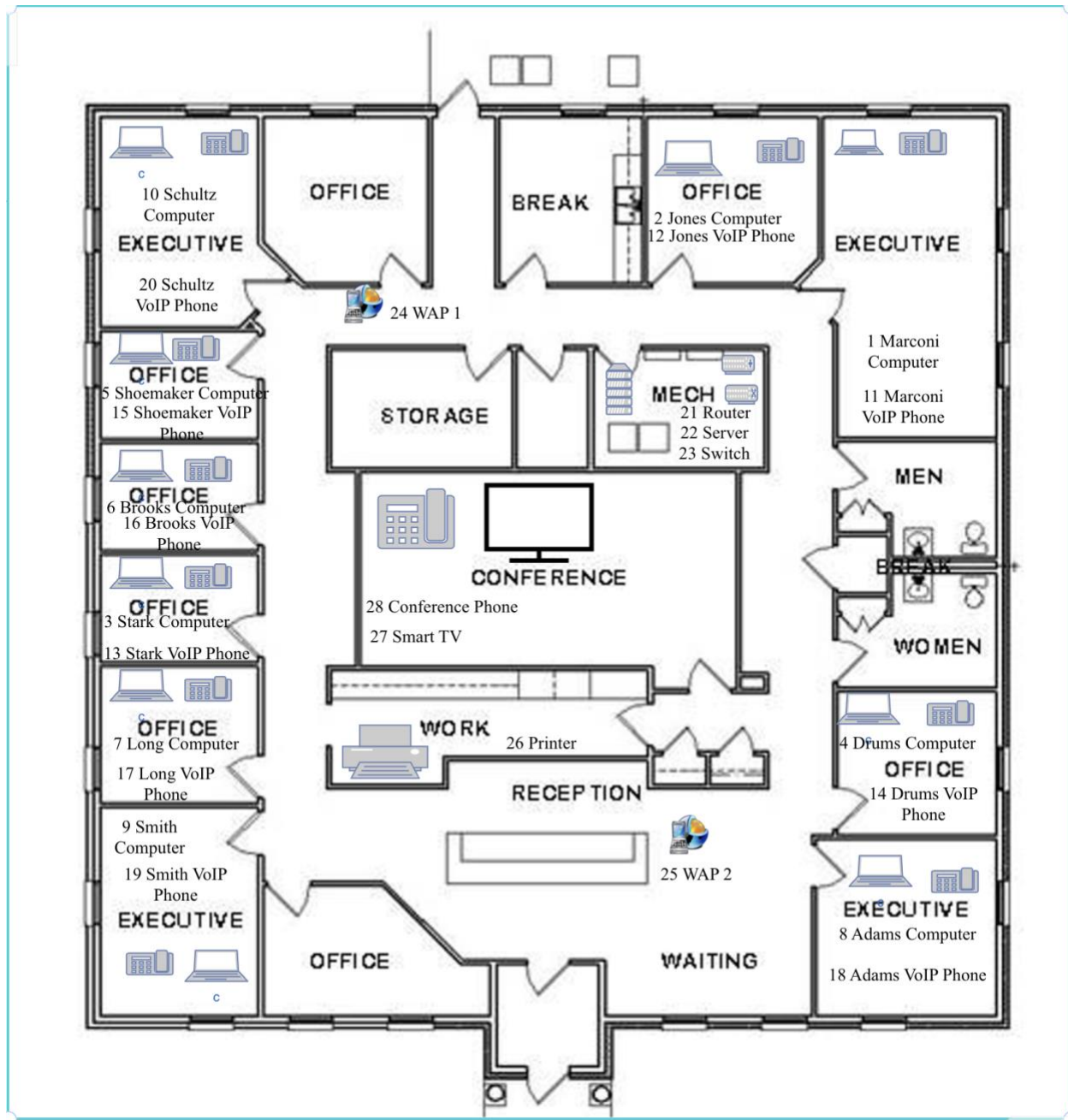
User Accounts	Setup and Configuration Process
Dan Marconi Phil Jones Karen Stark Evelyn Schultz Bill Shoemaker Mike Drums Lisa Brooks Terry Long Samuel Adams Brian Smith	Step 1: Launch Windows Server 2019 VM Step 2: Log into server using admin password Step 3: Open Server Manager by going to Windows Start Menu and click on Server Manager Step 4: Click on Tools (Top Right) Then Go to Computer Management Step 5: Go to Local Users and Groups, then click on User Step 6: Right Click to Create new User (All 10)
Groups	Setup and Configuration Process
_Attorneys _Accounting _Administrative	Step 1: Launch Windows Server 2019 VM Step 2: Log into server using admin password Step 3: Open Server Manager by going to Windows Start Menu and click on Server Manager Step 4: Click on Tools (Top Right) Then Go to Computer Management Step 5: Go to Local Users and Groups, then click on Group Step 6: Right Click to Create Group (all 3)
Folders and Permissions	Setup and Configuration Process

Attorneys Accounting Administrative	Create Folders Step 1: Launch File Manager Step 2: Double-click on Local C drive Step 3: Right Click, Go to New Step 4: Click on Folder (for Marconi Documents) Step 5: Then double click on the new folder you just created Step 6: Right click, hover to New Step 7: Click on Folder (All 3) Set Sharing Permissions Step 1: Launch Windows Server 2019 VM Step 2: Log into server using admin password Step 3: Open Server Manager by going to Windows Start Menu and click on Server Manager Step 4: Click on Tools (Top Right) > Computer Management Step 5: Go to and double click on Shared Folders Step 6: Go to and double click on Shares Step 7: Right Click inside Shares > New Share Step 8: Then click on Next > Browse > Local Disk > Marconi Documents> Attorneys > (Then follow proper sets of permissions)
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User Logins and Passwords

Employee Name	Employee Title	Login ID	Password
Dan Marconi	President/ Attorney	Dmarconi	Fullsail1
Phil Jones	Attorney	Pjones	Fullsail1
Karen Stark	Attorney	Kstark	Fullsail1
Evelyn Schultz	Admin Assistant	Eschultz	Fullsail1
Bill Shoemaker	Attorney	Bshoemaker	Fullsail1
Mike Drums	Attorney	Mdrums	Fullsail1
Lisa Brooks	Attorney	Lbrooks	Fullsail1
Terry Long	Attorney	Tlong	Fullsail1
Samuel Adams	Attorney	Sadams	Fullsail1
Brian Smith	Accountant	Bsmith	Fullsail1

Network Topology Diagram with Employee Names and Node Numbers



Capital and Operating Costs

Hardware and Software	Per Unit Cost	Quantity	Total Cost
Laptops	772.99	10	7729.9
Router	399.99	1	399.99
Server	1106.99	1	1106.99
Switch	1003.96	1	1003.96
Server Hard Drives (Consider a RAID 5)	239.99	3	719.97
VoIP Phones	109.00	10	1090.00
Conference Phone	789.99	1	789.99
WAPs	114.99	2	229.98
Printer	1149.99	1	1149.99
Smart TV	714.99	1	714.99
Windows Server 2019	964.99	1	964.99
Windows 10 Pro	Included		
Labor	\$125	40 hrs.	\$5,000
Annual ongoing network maintenance and support	\$15,000	1 yr.	\$15,000
GRAND TOTAL	-	-	35900.75

Hardware and Software Specification Tables

Laptops

Brand/Manufacturer	Lenovo
Product Line	ThinkPad E14 Gen-4
Model	21EB
Processor/Clock Speed	2.3 GHZ
Memory/Speed	3200 megahertz
Hard Drive/Capacity	256 GB
Embedded Security	Discrete Trusted Platform Module (TPM 2.0) Security Chip
Display/Size/Resolution	300 candela per square meter/ 14 inch/ Full HD
Networking	802.11a/b/g/n/ac/ax, Bluetooth 5.2/ Gigabit Ethernet
Operating System	Windows 10 Pro, Windows 11 Pro
Cache	L3 cache / 16 megabyte
Page URL	https://www.cdw.com/product/lenovo-thinkpad-e14-gen-4-14-ryzen-5-5625u-16-gb-ram-256-gb-ssd/7017507

Server

Brand/Manufacturer	HPE
Product Line	HPE ProLiant
Model	DL20 Gen10 Plus Performance
Hard Drive/Capacity	480GB
Processor	Intel
Memory/Speed	3200 megahertz
Storage Controller	RAID
Monitor	
Ethernet	Broadcom BCM5720
Operating System	
Networking	
Expansion Bays	4 (total) / 4 (free) x hot-swap 2.5" SFF
Expansion Slots	1 (total) / 1 (free) x PCIe 4.0 x16 - half-length, full-height (x8 mode), 1 (total) / 1 (free) x PCIe 4.0 x8 (low-profile)
Page URL	https://www.cdw.com/product/hpe-proliant-dl20-gen10-plus-performance-rack-mountable-xeon-e-2314-2.8/7020901

Server Hard Drives

Brand/Manufacturer	HPE
Product Line	HPE
Storage Type	
Hard Drive Type	Hot-swap hard drive
Form Factor	2.5"
Interface	1 x SATA 6 Gb/s - 7 pin Serial ATA
Capacity	480 GB
Data Transfer Rate (DTR)	600 MBps
Page URL	https://www.cdw.com/product/hpe-ssd-read-intensive-480-gb-sata-6gb-s/6619560

Router

Brand/Manufacturer	TP-Link
Product Line	TP-Link
Model	ER8411
RAM	4 GB DDR4
Flash Memory	4MB SPI NOR + 256 MB NAND
WAN Ports Qty	8
Integrated Switch	
Data Link Protocol	10 Gigabit Ethernet
Network/Transfer Protocol	10/100/1000Base-T, 1000Base-X, 10GBase-X
Page URL	https://www.cdw.com/product/tp-link-er8411-enterprise-wired-10g-vpn-router/7316744

Switch

Brand/Manufacturer	SonicWALL
Product Line	SonicWall Switch
Model	SWS14-24FPOE
RAM	512 megabytes
Flash Memory	128 megabytes
Performance	128 Gbps
Capacity	Virtual interfaces (VLANs): 4096
Ports Qty*	28
Page URL	https://www.cdw.com/product/sonicwall-switch-sws14-24fpoe-switch-28-ports-managed-rack-mountabl/6392679

Printer

Brand/Manufacturer	Brother
Product Line	Brother
Model	MFC-L9610CDN
Duty Capacity	1620 Sheets
Printing Output Type	Color
Processor	
RAM	2 GB
Networking	
Page URL	https://www.cdw.com/product/brother-mfc-l9610cdn-multifunction-printer-color/7419170

Wireless Access Points (WAPs)

Brand/Manufacturer	TP-Link
Product Line	TP-Link
Model	EAP653
Antenna	Internal Omni • 2.4 GHz: 2× 4 dBi • 5 GHz: 2× 5 dBi
Capacity	
Networking	Dual Band
Interface	1× Gigabit Ethernet (RJ-45) Port (supports IEEE802.3at PoE)
Power	14.70 watt
Page URL	https://www.cdw.com/product/tp-link-eap653-omada-true-wifi-6-ax3000-wireless-gigabit-ceiling-mount-ac/7363837

Smart TV

Brand/Manufacturer	Samsung
Model	Samsung
Series	UN65DU8000F
Video Interface	HDMI
HDMI Ports Qty	3
Diagonal Size	64.5
Resolution	4K (3840 x 2160)
Display Format	
Viewing Angle	
Digital Audio Format	1
USB Ports Qty	2
Wi-Fi Protocol	Yes (Wi-Fi 5)
Page URL	https://www.cdw.com/product/samsung-un65du8000f-du8000-series-65-class-64.5-viewable-led-backlit/7849336

Conference Phone

Brand/Manufacturer	Yealink
Product Line	Yealink
Model	CP925
Type	Conference VoIP phone
Call Services	Call Forwarding, Call Hold, Call Transfer, Call Waiting, Voicemail
Speakerphone	Yes
Features	Built-in 1-microphone array for noise cancellation, Built-in 6-microphone array voice pickup, Echo Cancellation, Noise Suppression
Phone connections	USB Type-C
Page URL	https://www.cdw.com/product/yealink-cp925-conference-voip-phone-with-bluetooth-interface-5-way-ca/6812335

Server Software

Brand/Manufacturer	Microsoft
Product Line	Microsoft Windows
Version	2019
Licensing	Microsoft Products and Services Agreement/ 20 user CALs
Page URL	https://www.cdw.com/product/microsoft-windows-server-2019-license-20-user-cals/6269374

Client Software

Brand/Manufacturer	Microsoft
Product Line	Windows 10
Version	10
Licensing	Microsoft Products and Service/ 1 Device
Page URL	https://www.cdw.com/product/windows-10-pro-upgrade-license-1-device/3446584

VoIP Phones

Brand/Manufacturer	Grandstream
Product Line	Grandstream
Model	GXP2135
Type	VoIP phone
Conference Call Capability	4-way

Call Services	Call Forwarding, Call Hold, Call Transfer, Call Waiting, Caller ID, Voicemail
Speakerphone	YES
Additional Functions	
Features	Integrated Ethernet switch
VoIP Protocols	SIP
IP Address Assignment	DHCP, PPPoE, Static
Network Protocols	ARP, HTTP, HTTPS, ICMP, IP, Link Layer Discovery Protocol (LLDP), RTCP, RTP, SRTP, TCP, TFTP, TR-069, UDP
PoE Support	YES
Voice Features	G.711a, G.711u, G.722, G.726, G.729a, G.729b
Page URL	https://www.cdw.com/product/grandstream-gxp2135-voip-phone-with-bluetooth-interface-4-way-call-ca/4351720

Timesheets

Milestone	Activity Description (be descriptive)	Start Time	End Time	Total Activity Time	Activity Date
Milestone 1	Naming / Reading project/ Planning	Tuesday 7:00 PM	Tuesday 7:30 PM	30 mnts	Jun 4 2024
Milestone 1	Network Diagram	Wednesday 7:00 PM	8:00 PM	1hours	Jun 5 2024
Milestone 1	Capital and Operating Costs Research	Friday 3:00 PM	Friday 9:00 PM	6hours	June 7 2024
Milestone 2	Project Scope	Tuesday 7:00 PM	Tuesday 9:00 PM	2 Hours	June 11 2024
Milestone 2	Network Objective/ Ip Table	Wednesday 12:00 PM	Wednesday 4:00 PM	4 Hours	June 12 2024
Milestone 2	Update Net Diagram	Thursday 2:00 PM	Thursday 4:00 PM	2 Hours	June 13 2014
Milestone 3	Setup Server	Tuesday 7:00 Pm	Tuesday 10:00 Pm	3 hours	June 18 2024
Milestone 3		Wednesday 12:00 PM	Wednesday 4:00 PM	4 Hours	June 19 2024
Milestone 3		Thursday 3:00 PM	Thursday 7:00 PM	4 hours	June 20 2024
Milestone 4	Review Hardware specific	Tuesday 7:00 PM	Tuesday 7:30 PM	30 mnts	June 25 2024
Milestone 4		Wednesday 12:00 PM	Wednesday 4:00 PM	4 hours	June 26 2024
Milestone 4		Thursday 2:00 PM	Thursday 4:00 PM	2 Hours	June 27 2024
TOTAL HOURS				33 Hours	

Status Reports

Accomplished this week

Milestone 1: Naming / Planning / Finish the diagram.
Milestone 1: Research Equipment/Cost.
Milestone 1: Finish Hardware specification.
Milestone 2: Project Scope.
Milestone 2: Network Objective/ Ip Table.
Milestone 2: Update Net Diagram.
Milestone 3: Setup Server.
Milestone 3: Setup files sharing / proper permissions.
Milestone 3: Setup User for all employees.
Milestone 4: Review Hardware specific.
Milestone 4: Make adjustment.
Milestone 4: Prepare project presentation video.

Planned for next week

Coming up for milestone 2: <i>For upcoming week I am planning to define the project scope</i>
Coming up for milestone 2: I will Define the network benefits.
Coming up for milestone 2: I will be creating the static IP address and naming.
Coming up for milestone 3: <i>For upcoming week I am planning to start with the Network Configuration</i>
Coming up for milestone 3: <i>For upcoming week I am planning to set up User Logins and Passwords</i>
Coming up for milestone 3: I will Finish the Network Conf.

Coming up for milestone 4: <i>I will be reviewing the Project table content.</i>
Coming up for milestone 4: I will be reviewing the project hardware components.
Coming up for milestone 4: Make all necessary adjustment needed.

Comments for each milestone

Milestone 1:

What problems did you run into?

- The issues I encountered were largely related to the hardware; I was unable to locate a few of the specifications. Furthermore, it was difficult to determine which was better to use for the tasks.

How did you fix them?

- I performed additional research and went to the manufacturers websites to find some of the specifications.

Is there anything that you did not complete that you now have to push off into the next milestone? No

Any other comments?

- As of right now, I've chosen certain hardware that I might consider changing for a better one, but because I want to keep our costs within budget, I'll keep it as it is till we limit our scope creeps.

Milestone 2:

What problems did you run into?

- This week was smooth, no issue.

How did you fix them?

- N/A

Is there anything that you did not complete that you now have to push off into the next milestone?

- No, I have completed everything.

Any other comments? Still reviewing the hardware, thinking of updating the printer.

Milestone 3:

What problems did you run into? It was another great week, was able to set up Server and profiles with no issue

How did you fix them? N/A

Is there anything that you did not complete that you now must push off into the next milestone? No, everything's on time.

Any other comments? N/A

Milestone 4:

What problems did you run into? There wasn't no issue this week, just a little bit of hard choice, to decide whether to change printer or not.

How did you fix them? I decided to keep the current one.

Is there anything that you did not complete that you now must push off into the next milestone? NO

Any other comments? To guarantee that new hardware and software were seamlessly integrated across all departments, the network project needed to be completed with careful planning and coordination. Despite some early compatibility problems, proactive problem-solving enabled us to complete the project on schedule and within budget.