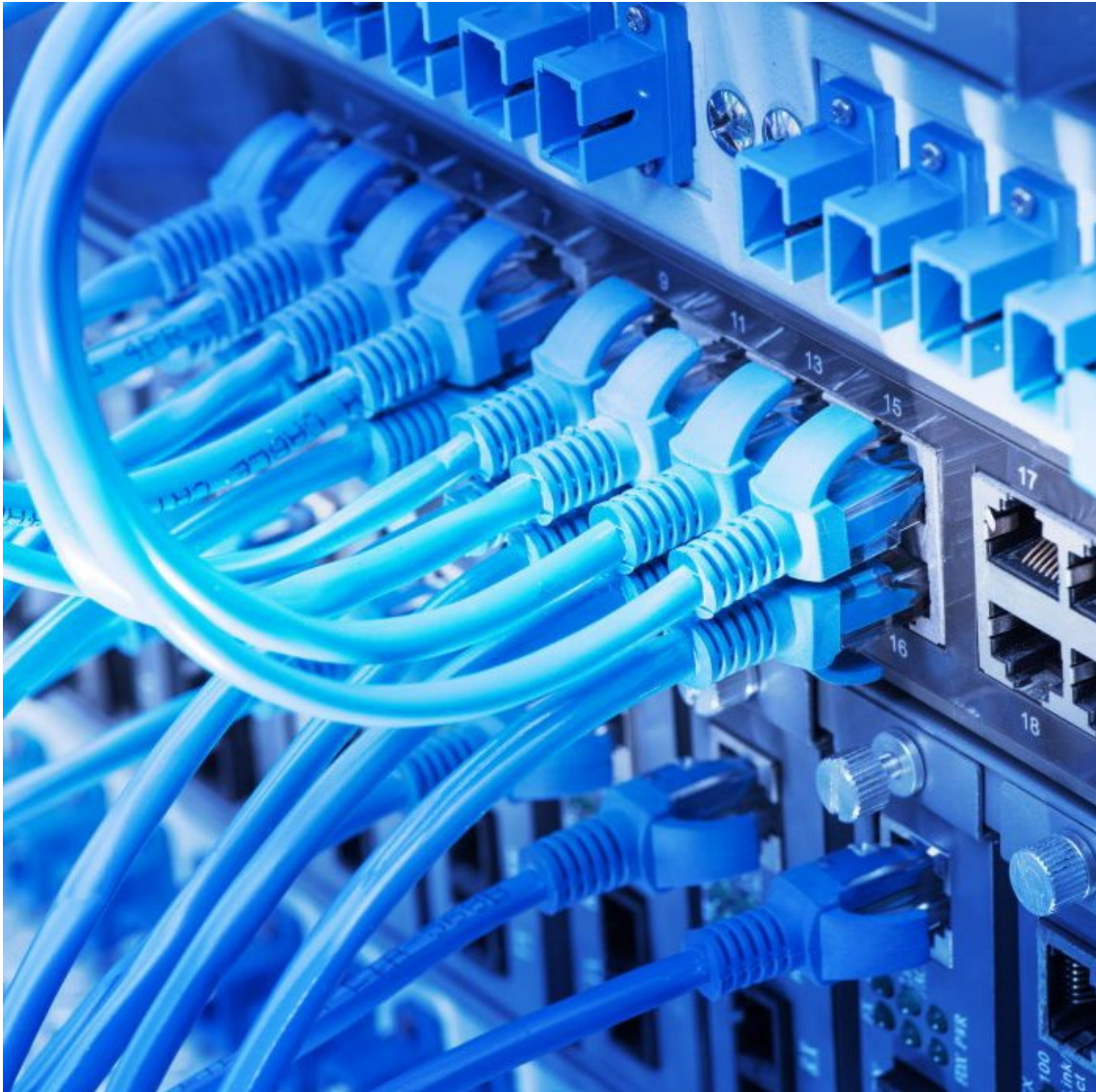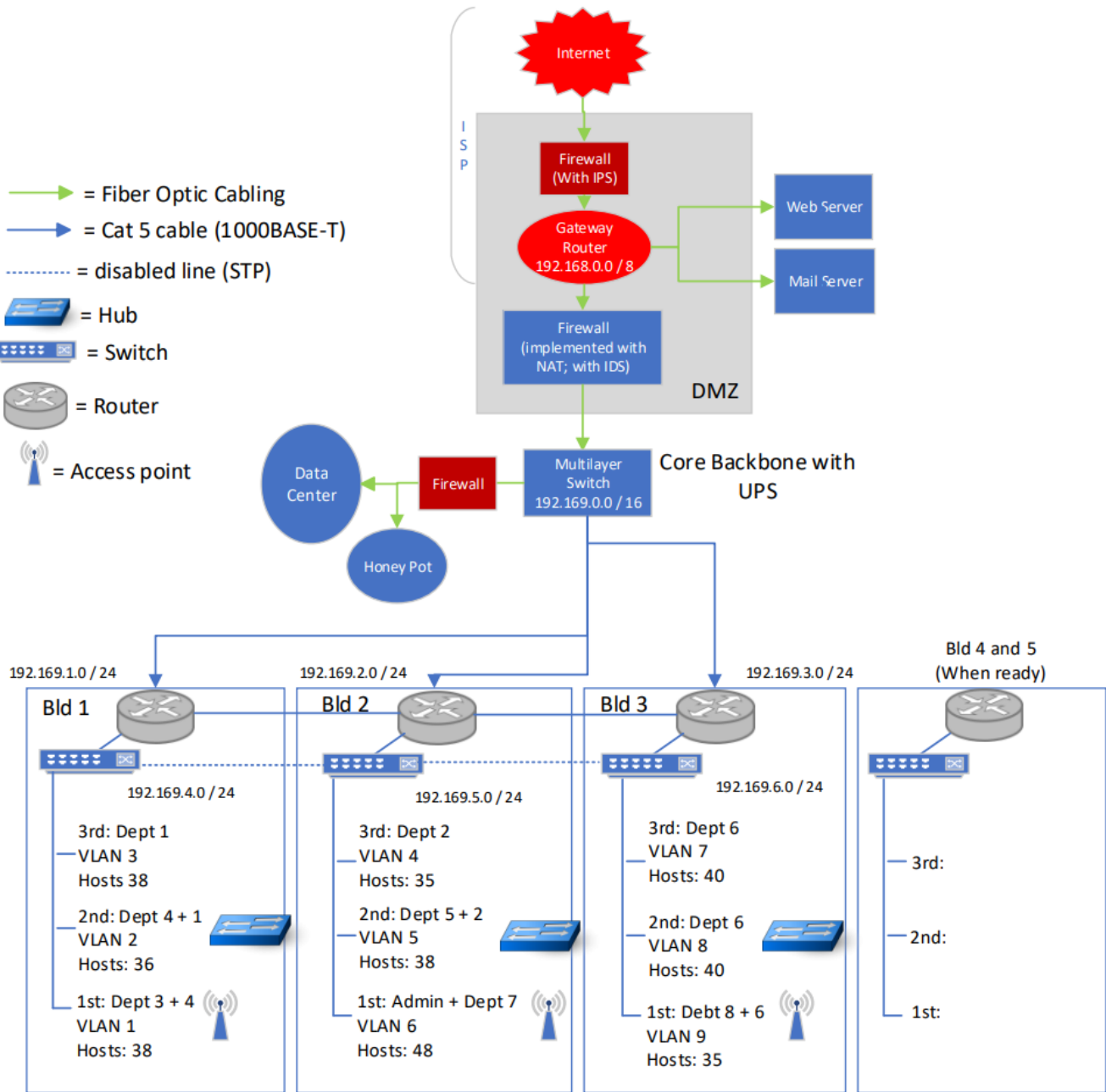# Data Communications

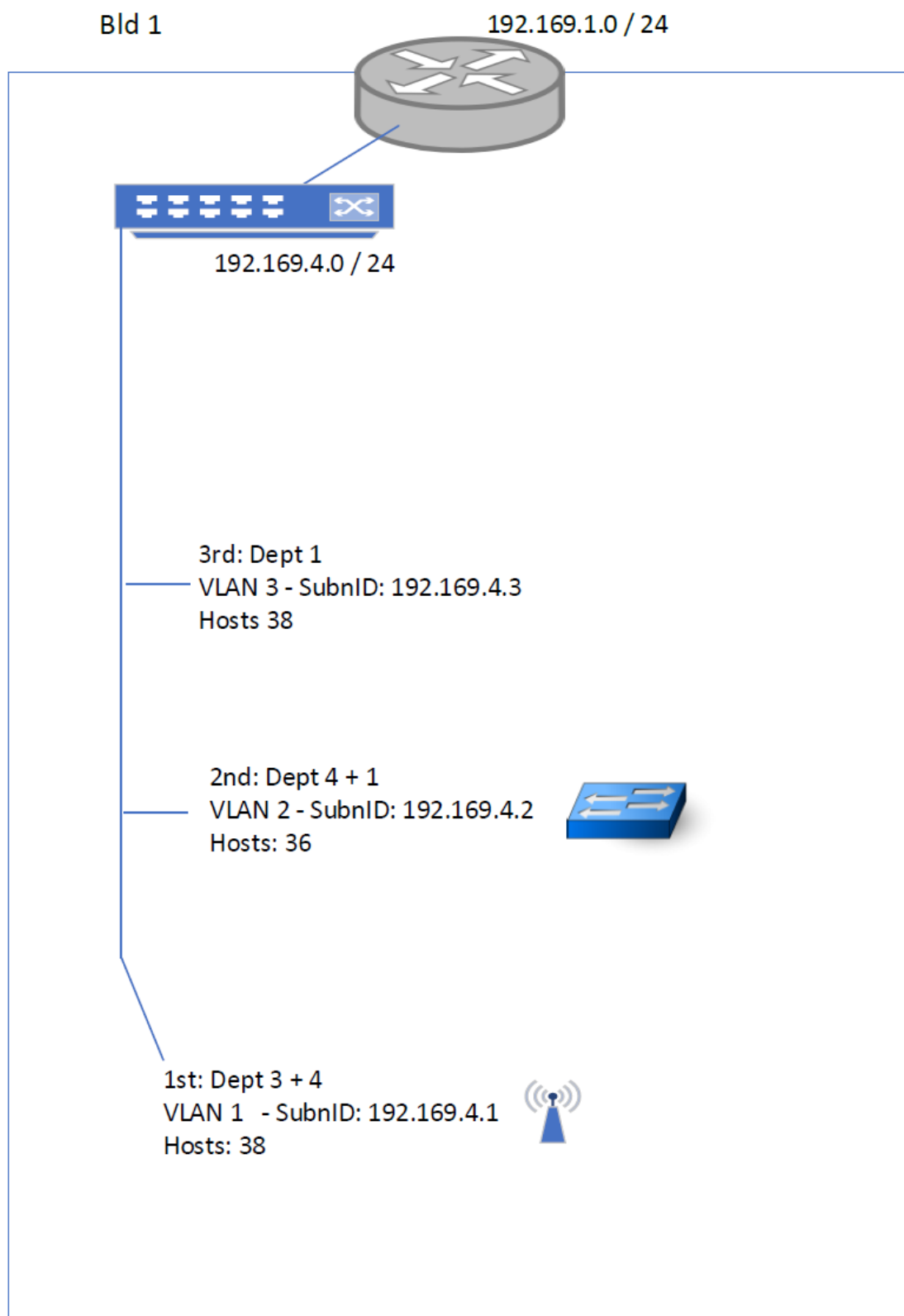# Enterprise Network Design

By: Tyler Hudson
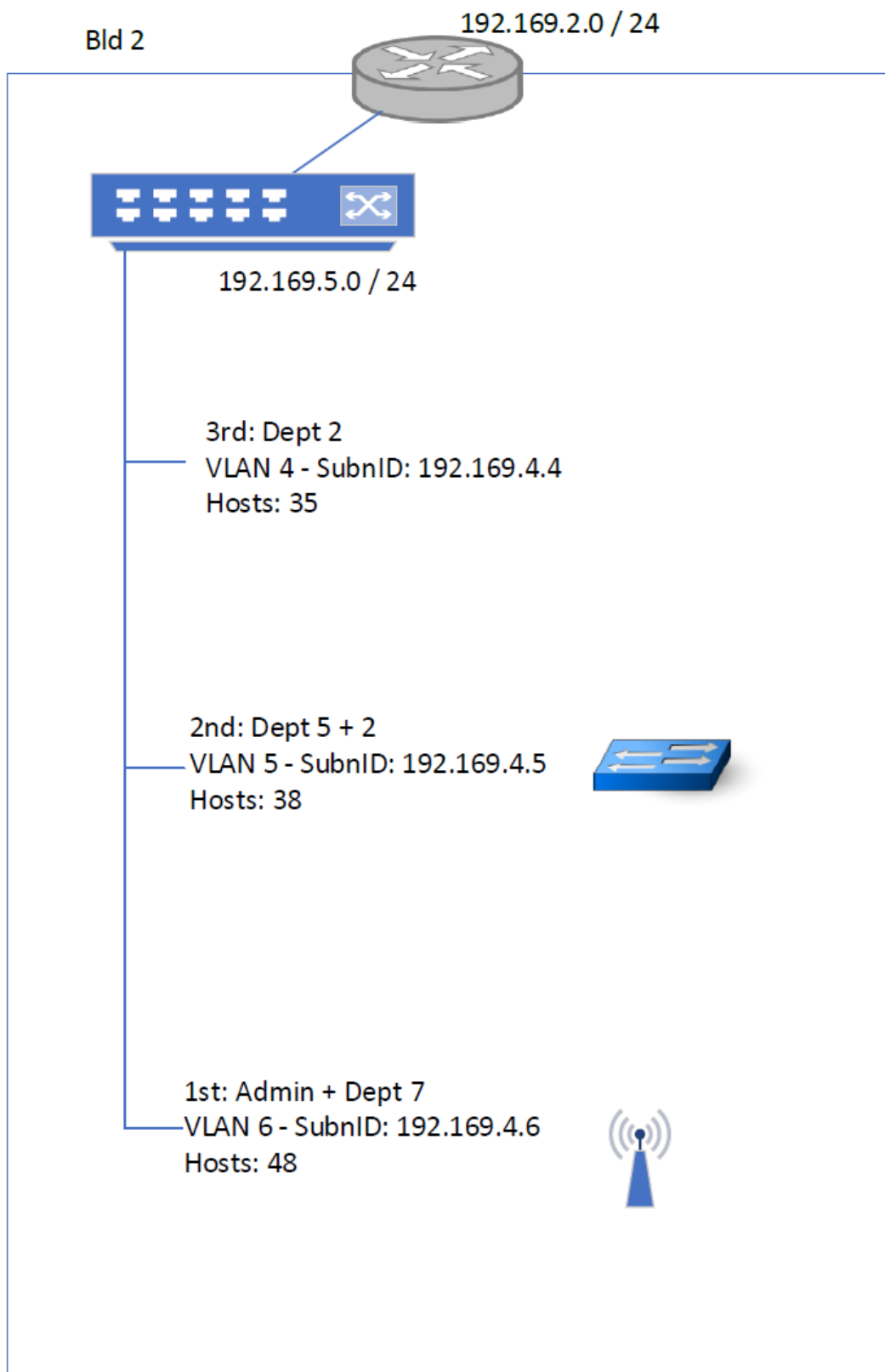
Data Comm

Network Design Project

Prepared for

Dr. Garry White

Fundamentals of Data Communication

Texas State University

Prepared by

Tyler Hudson

Computer Information Systems

Texas State

April 10, 2022

= Fiber Optic Cabling

= Cat 5 cable (1000BASE-T)

= disabled line (STP)

= Hub

= Switch

= Router

= Access point

Internet

ISP

Firewall
(With IPS)

Gateway
Router
192.168.0.0 / 8

Web Server

Mail Server

Firewall
(implemented with
NAT; with IDS)

DMZ

Data
Center

Firewall

Multilayer
Switch
192.169.0.0 / 16

Core Backbone with
UPS

Honey Pot

192.169.1.0 / 24

Bld 1

192.169.2.0 / 24

Bld 2

192.169.3.0 / 24

Bld 3

Bld 4 and 5
(When ready)

192.169.4.0 / 24

192.169.5.0 / 24

192.169.6.0 / 24

3rd: Dept 1
VLAN 3
Hosts 38

2nd: Dept 4 + 1
VLAN 2
Hosts: 36

1st: Dept 3 + 4
VLAN 1
Hosts: 38

3rd: Dept 2
VLAN 4
Hosts: 35

2nd: Dept 5 + 2
VLAN 5
Hosts: 38

1st: Admin + Dept 7
VLAN 6
Hosts: 48

3rd: Dept 6
VLAN 7
Hosts: 40

2nd: Dept 6
VLAN 8
Hosts: 40

1st: Debt 8 + 6
VLAN 9
Hosts: 35

3rd:

2nd:

1st:

Bld 1   192.169.1.0 / 24

192.169.4.0 / 24

3rd: Dept 1
VLAN 3 - SubnID: 192.169.4.3
Hosts 38

2nd: Dept 4 + 1
VLAN 2 - SubnID: 192.169.4.2
Hosts: 36

1st: Dept 3 + 4
VLAN 1 - SubnID: 192.169.4.1
Hosts: 38

192.169.2.0 / 24

Bld 2

192.169.5.0 / 24

3rd: Dept 2
VLAN 4 - SubnID: 192.169.4.4
Hosts: 35

2nd: Dept 5 + 2
VLAN 5 - SubnID: 192.169.4.5
Hosts: 38

1st: Admin + Dept 7
VLAN 6 - SubnID: 192.169.4.6
Hosts: 48

192.169.3.0 / 24

Bld 3

192.169.6.0 / 24

3rd: Dept 6
VLAN 7 - SubnID: 192.169.4.7
Hosts: 40

2nd: Dept 6
VLAN 8 - SubnID: 192.169.4.8
Hosts: 40

1st: Debt 8 + 6
VLAN 9 - SubnID: 192.169.4.9
Hosts: 35

Device	Name	Count	Device Cost (Approx.)	Cost
Switch	HP 5830	9	$1000	$9000
Cat5 Cabling	TygerWire Cat5 1000ft	5	$145.50	$727.50
Hub	Zyxel GS-108BV3	4	$33.99	$135.96
Access Points	Cisco Catalyst 9100 Access Points	6	$900	$5400
Network Attached Storage	Dell PowerEdge T30	2	$1500	$3000
Router	Cisco RV260W VPN Router	1	$600	$600
Router	Synology RT2600ac	3	$200	$600
TOTAL				$19,463.46

Present and Future Costs

Above is shown the cost of devices selected for ABC Company. These devices do not include software needed to keep the company protected and secure. To assure confidentiality, integrity and availability, the business will need to consider more purchases by the IT team's guidance. After the network is installed and running, more add-ons need to be made. Software needed will be: Antivirus & Antimalware software, Microsoft Teams or another collaboration application, and more various software.

Questions Needed Answered

- What is the total budget for the IT department concerning Base Network?

- What hardware will be provided to users?

- Is the company wanting Windows machines or Apple?

- Will companywide wi-fi be needed?

- Will workstations need to support ethernet and/or wireless?

- What is the current IT environment missing?

- Should part of the network environment be hosted within the cloud?

- What are our current cyber security risks?

- How does the network environment support business strategy?

  o How big will it impact the overall strategy?

- What do the users say? (IT wise)

  o What is the company missing?

  o Is the current speed of the network too slow?

- What is the speed wanted?

- How much does the company expect to grow within the next 5-10 years?