



# RESPONSE TO RFP

Group 3

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## IS 6640

Networking and Servers

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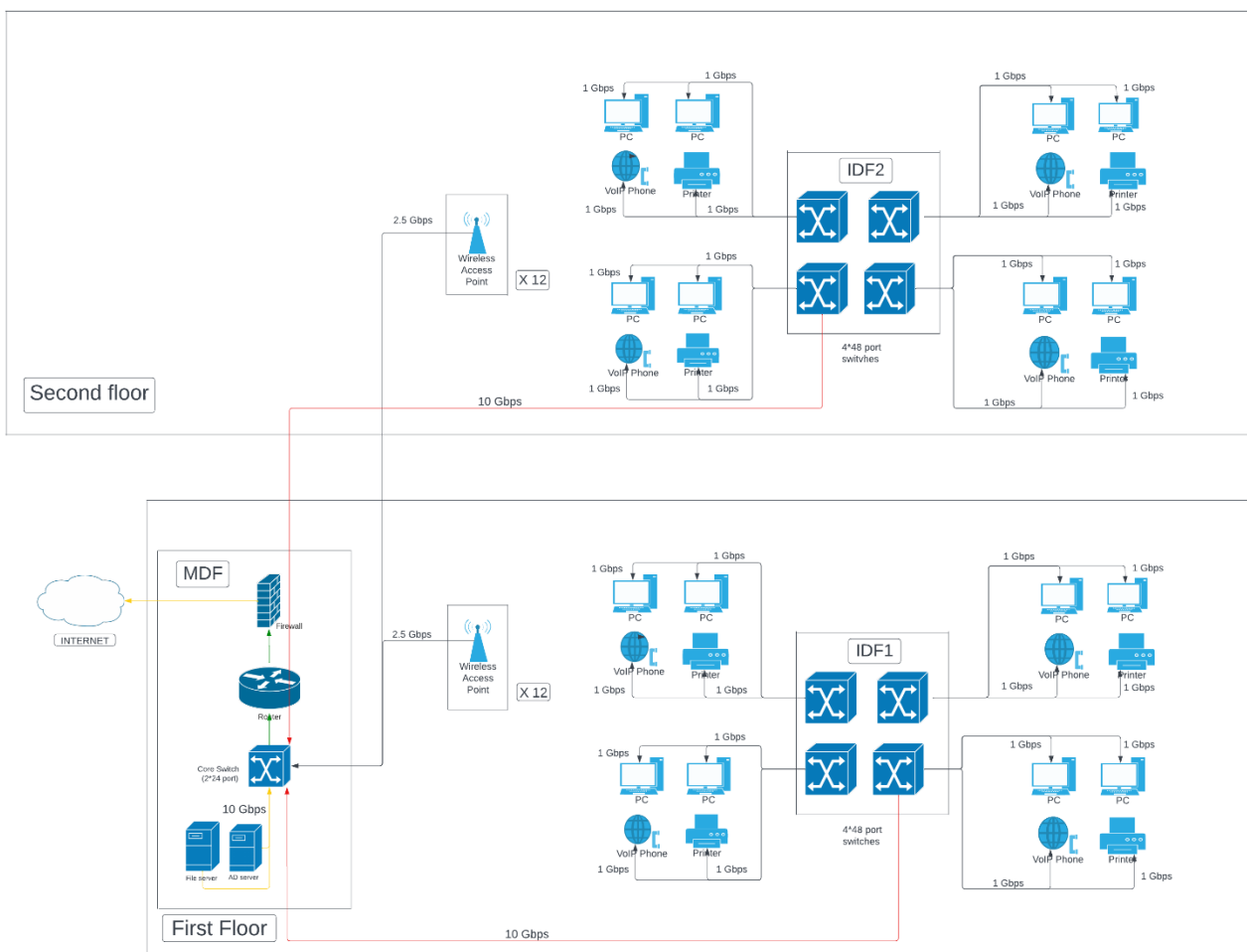
# Introduction

This proposal is in response to the Win Financial Group (WFG) request for proposal on the new IT infrastructure project. The proposed solution covers the two floors of a new office building with a total of 20,000 square feet. The solution encompasses a core network, an edge network, and additional services. This proposal encompasses plans for up to 200 employees, including server infrastructure, wired network infrastructure, wireless network infrastructure, and cloud services.

This proposal does not include items to be covered by the WFG helpdesk administrators and will not include basic IT needs such as personal computers, phones, email servers, patch cables, power supplies and other basic IT needs. This proposal does not account for the labor and installation and only covers the listed IT infrastructure as well as the network mapping.

## Network Maps

### Layer 1 Map



# VLAN Configuration

VLAN Name	Purpose	Total IP Addresses	IP Network	Subnet Mask
VLAN 10	Server Network	12	192.168.10.0/28	255.255.255.240
VLAN 20	Floor 1 Computers	60	192.168.20.0/26	255.255.255.192
VLAN 30	Floor 2 Computers	60	192.168.30.0/26	255.255.255.192
VLAN 40	IP Phone Network	200	192.168.40.0/24	255.255.255.0
VLAN 50	Wi-Fi Network	900	192.168.50.0/22	255.255.252.0

## Bills of Materials

### Wired Network

Make	Model	Description	Qty	Units	Unit Price	Total
Ubiquiti	USW-Pro-48-PoE	USW-Pro-48-PoE Layer 3 Switch with 10 Gigabit Ethernet, Gigabit Ethernet support VLANs	8	1	\$1,117.42	\$8,939.36
Ubiquiti	Professional 48 PoE	Core Switch, 16 SFP+ ports for 10G connectivity, 12 Ethernet ports, Managed, Routing capability	1	1	\$1,500.00	\$1,500.00
Ubiquiti	UDM-SE Dream Machine	Network Device Manager with high-speed capability, 2.5GbE RJ45 ports, full control over other UniFi devices	1	1	\$400.00	\$400.00
<b>Total Cost</b>						<b>\$10,439.36</b>

### Wireless Network

Make	Model	Description	Qty	Units	Unit Price	Total
Aruba	Aruba AP-515 (Q9H63A)	Dual Radio 4x4: 4 + 2x2: 2 802.11Ax (4.8Gbps in 5GHz 575Mbps in the 2.4GHz Band)PoE-powered	16	1	\$709	\$11,200.00
<b>Total Cost</b>						<b>\$11,200.00</b>

### Servers

Make	Model	Description	Qty	Units	Unit Price	Total
Dell	PowerEdge R660xs	Rack Server	2	1	\$5,707.05	\$11,414.10
Intel	Intel® Xeon® Silver 4410Y	2G, 12C/24T, 16GT/s, 30M Cache, Turbo, HT (150W) DDR5-4000	2	1	\$209.40	\$418.80
Dell	16GB RDIMM, 4800MT/s Single Rank	16GB of RAM, 4800MT/s Single Rank	2	1	\$599.25	\$1,198.50
Dell	Broadcom 57414	Dual Port 10/25GbE SFP28, OCP Network Interface Card 3.0 6Gb/s SATA BASE-T Adapter, OCP NIC 3.0	2	1	\$332.40	\$664.80
Dell	Front PERC H355 Front Load	12Gb/s SAS 6Gb/s SATA	2	1	\$1,004.40	\$2,008.00

Dell	1.92TB SSD SAS, RI	6*1.92TB SSD (RAID 10) SAS 12Gbps 512e MU 2.5in Hot-Plug	6	1	\$2,068.65	\$10,534.60
Dell	480GB SSD SATA	2*480GB SSD (RAID 1) SATA Mixed Use 6Gbps 512e	2	1	\$839.00	\$1,678.00
Windows	Windows Server 2022/2019 Device CALs	Required Licenses	200	1	\$35	\$7,000
Windows	License for 16 cores	Required Licenses	1	1	\$972	\$972
<b>Total Cost</b>						<b>\$35,888.80</b>

## Cloud Services

For this proposal, we recommend Microsoft Azure as a cloud platform. It provides several benefits over other cloud services such as:

- High reliability
- Scalable environment for businesses of all sizes
- Cost-effective choice for small & medium businesses
- Microsoft has more data centers than other service providers like AWS, Google cloud etc.
- For Active Directory, there is no additional server provisioning

We are choosing Microsoft Entra ID P1 Premium

Total no of users is 200

Cost per 1 user is \$6.00

Total cost per month is \$1200.00

Total annual cost is \$14400.00

No of users	Cost per month	Total cost per month	Total annual cost
200	\$6.00	\$1200.00	\$14,400.00

## Summary

The proposed equipment listed under the Bill of Materials section meets the needs of the WFG for the IT infrastructure project. The requirements, and any recommendations for additional needs not considered are discussed in depth below.

After in-depth research and consultations with Ubiquiti, we've crafted a wired networking framework tailored to our structure. Specifically:

For the wired network, Ubiquiti offers a complete solution. This solution includes:

Eight USE-Pro-48-PoE edge switches, each with 48 PoE+ ports and 2 SFP+ uplink ports for 10G connectivity, will cater to our 100 PCs

The UDM-SE Dream Machine, equipped with 2.5GbE RJ45 ports, ensures optimal network speeds and provides centralized control over all UniFi devices.

We recommend two 1000ft spools of Cat 6a Ethernet Cable. This choice, compatible with 10G speeds and PoE+, ensures robust connectivity across both IDFs and the MDF.

The ICMPP0486B Patch Panel with 48 Cat 6a ports will facilitate organized cable management.

Lastly, the UniFi XG core switch, boasting 16 SFP+ ports for 10G connectivity and routing capabilities, becomes the network's backbone, ensuring seamless communication between devices.

The proposed solution for the wireless network will be the Aruba AP-515 access points. These are capable of 2.6 Gb speeds through both 802.3az ethernet ports. The access points also support link aggregation to further increase redundancy and capacity. The access points can support multiple SSIDs for private company connections as well as a guest network. The access point is capable of Wi-Fi 6 (802.11ax) and contains both a 2.4GHz and 5GHz band to maximize compatibility and speeds with devices.

The solution for the server will be a Dell PowerEdge R660xs Rack Server. The Dell PowerEdge R660xs server contains the following: 16 core CPU (Processor), OCP 3.0 Network Adapters (NIC), 16GB Memory (RAM), and a 100 GB Disk (Hard Drive). Regarding raid level, we chose raid 10 with 480GB SSD giving us a total of 5.76 usable storage space. For the Required Software licensing, we recommend the Windows Server 2022/2019 Device CALs and the License for 16 cores. Since there might be multiple users for one device (work-computer), and there is anticipation for growth to 200 employees in the coming year, we recommend two of the same servers to accommodate that. To keep the system going with less interruptions as much as possible, we recommend getting Dell "ProSupport Plus and 4Hr Mission Critical" Support Services for at least 36 months (about 3 years). Also, because these are rack servers, we recommend the dell" Ready Rails A11 drop-in/stab-in Combo Rails with Cable Management Arm" to keep the servers off the floor.

Combining the costs of the infrastructure in the server, wired network, and wireless network Bills of Materials, the one-time cost of infrastructure comes out to \$57,528.16. In addition, the ongoing cloud costs are an additional \$14,400 per year. This proposal includes all the one-time infrastructure costs as well as a 1-year initialization cost for the cloud services. After the initial 1-year period, renewal of cloud services will be the responsibility of the WFG. The breakdown of costs can be seen in the table below.

Bill of Material	Cost
Wired Network	\$10,439.36
Wireless Network	\$11,200.00
Server Hardware	\$35,888.80
Cloud Services (1-year initialization cost)	\$14,400.00
<b>Total Cost</b>	<b>\$71,928.16</b>