FIT9137 Assignment2 Request for Proposal

Design wired Lans, Wireless LANs and Backbone Wide Area Network Support
Submitted by Ziqi Pei （ID：33429472）

Obejective

1 Our goal is to establish a network system for the two new buildings and enable communication between them.
2 To achieve this, we need to ensure that each building can accommodate 120 staff members and provide both wired and wireless network access.
3 Additionally, the network must provide accessibility to common services, including network services, for the two buildings.

Broadband Minimum Requirements

To Meet the minimum traffic requirements we expect 150 user at peak hours

one staff minimum traffic network need = (25+30)/2 $\times$（1+30%）Wired is 30 percent faster than wireless = 35.75M

Minimum broad usage = staff $\times$ 150 = 5363M

Which means that the building must be capable of handing a minimum = Minimum broad usage/2)(building) = 2681M

This translate a minimum requirement of per floor = 2681/2 = 1341m

To achieve this ,we propose to install two 10 Gigabit Ethernet Switches on each floor. This configuration will provide sufficient band with to meet the minimum traffic requirements

The minimum amount of data that each switch need to transmit is 1341/2=670.5M

Broadband Maximum Requirements（Max）

To Meet the maximum traffic requirement we expect (240 + 110) handle the maximum traffic.

One staff maximum traffic need =(25+30)/2×（1+30%）=35.75M

We must ensure that the maximum peak the traffic load required is 35.75×（240+110）=12512.5M

There for the building must be capable of handing a maximum of 12512.5/2 = 6256.25M

Which translates to minimum requirement of 6256.25/2=3123.12Mfloor

The number of loads that each server needs to carry in the case of placing two switches at the same time3123.12/2=1564.06M

Logic Design
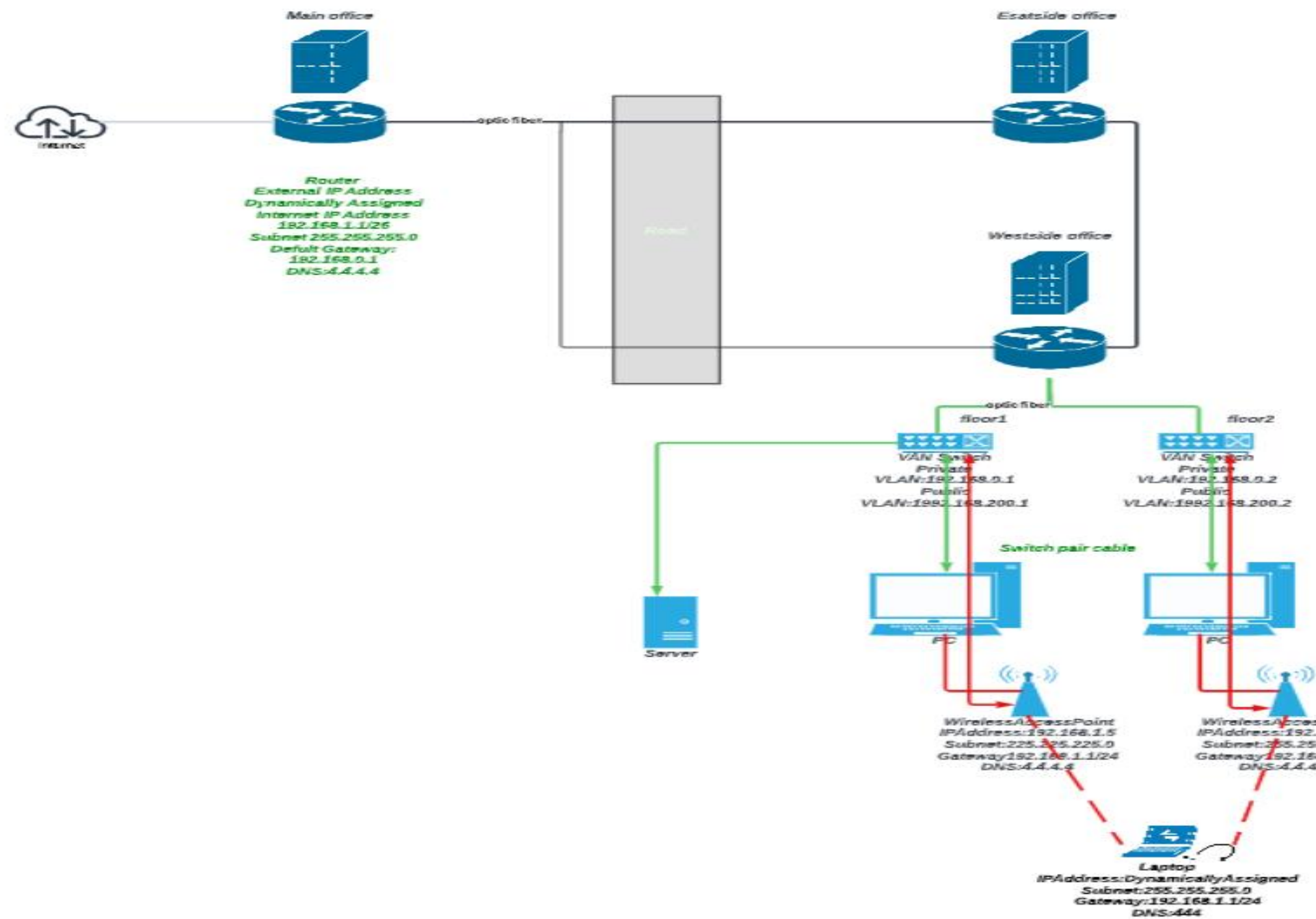
Traction

To establish a reliable and efficient wired network infrastructure, we have developed a floor plan that includes the 90 staff

Two 48-port 10-gigabit Ethernet switches, each of which has two 10-gigabit optic fiber ports to meet high-bandwidth demands.
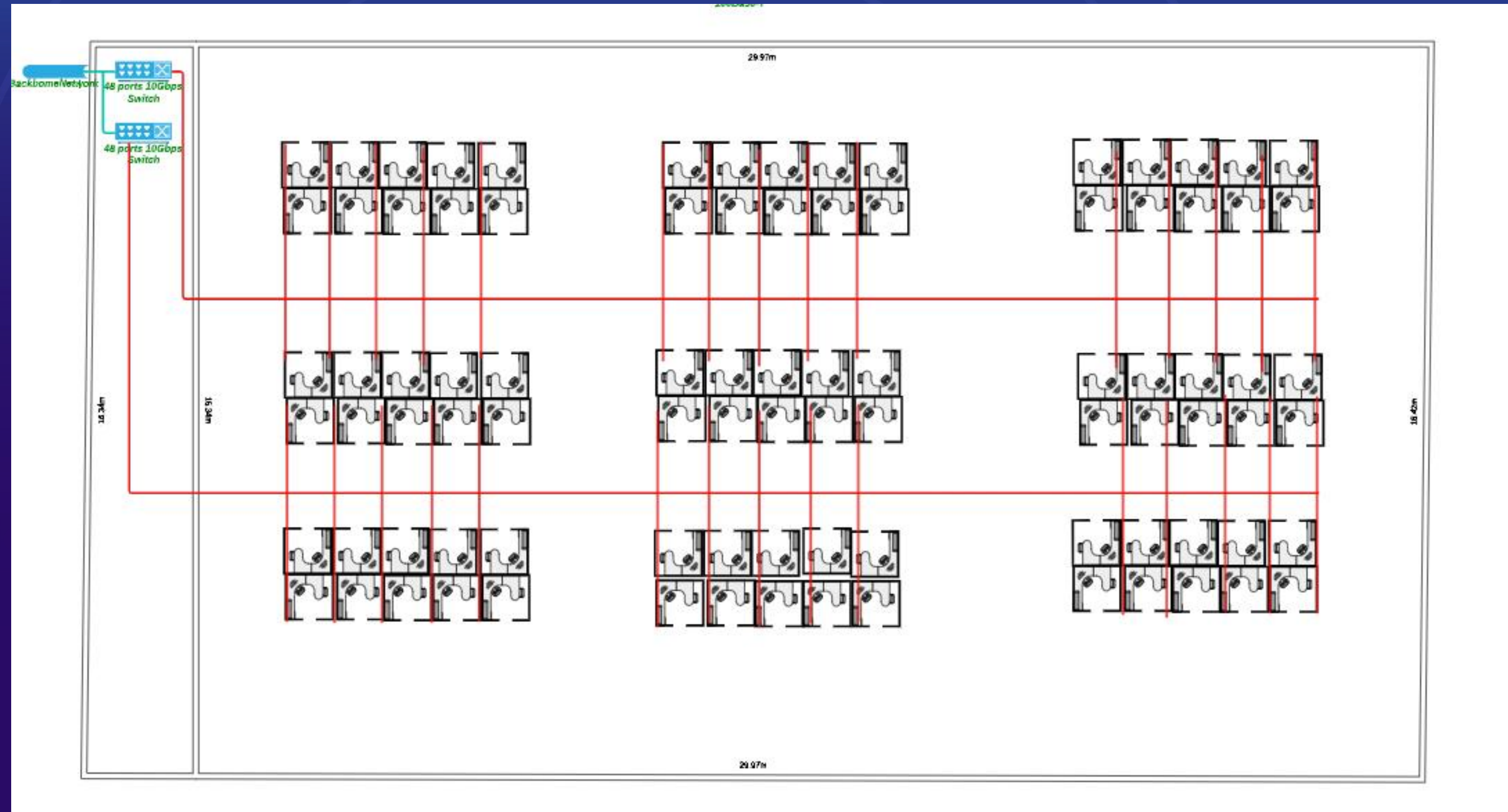
Six access points to provide wireless coverage and mobility for our staff.

Six Cat-10 cables, each 50 meters in length, to connect the switches and access points and provide fast and reliable network connectivity.

Two 10 Gb optic fiber cables, each 100 meters long, for high-speed communication between the buildings, ensuring fast data transmission and efficient communication.

With this plan, we can establish a high-speed, reliable, and secure wireless network infrastructure that meets the needs of our 90 staff members for their daily work and production activities.

Wireless Network Floor Plan for Supporting 90 Staff Laptops

Wireless Network Floor Plan for Supporting 90 Staff Laptops

To ensure seamless wireless network coverage for 90 staff members, we have developed a floor plan that includes the following components:

Two 48-port 10-gigabit Ethernet switches that provide high-speed data transfer and allow multiple devices to connect simultaneously.

Six access points that enable wireless devices to connect to he network and provide stable and fast network connectivity.

Six Cat-10 cables, each 50 meters in length, to connect the switches and access points and ensure reliable network performance.

Two 10 Gb optic fiber cables, each 100 meters long, for long-range and high-speed communication between different parts of the network.

This floor plan has been designed to meet the wireless network requirements and provide a seamless and reliable network experience for all users.

Floor plan for Wireless Network
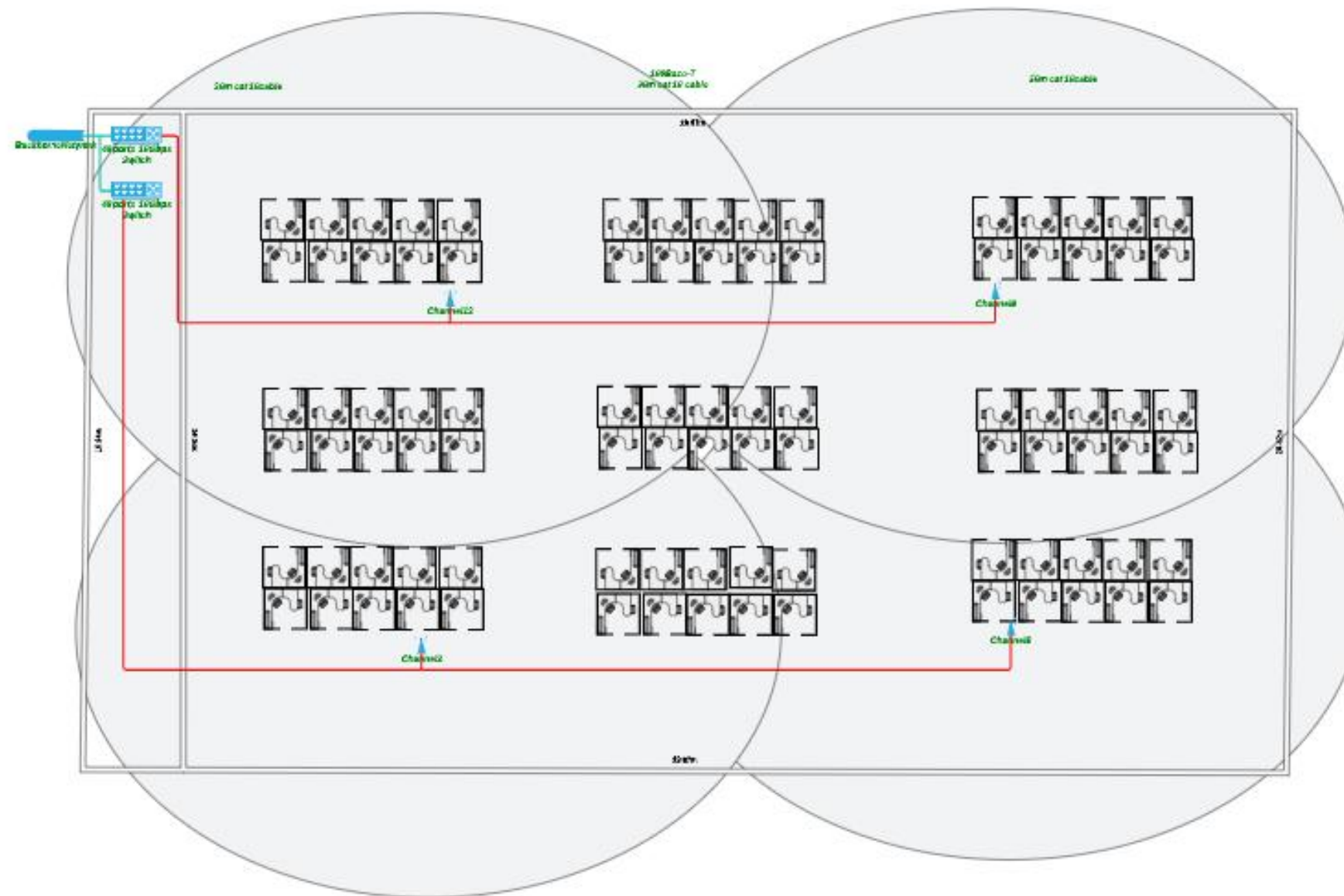
Designing a backbone network to facilitate inter-floor communication

Includes:

10Gigabit Ethernet switches with 48 ports each

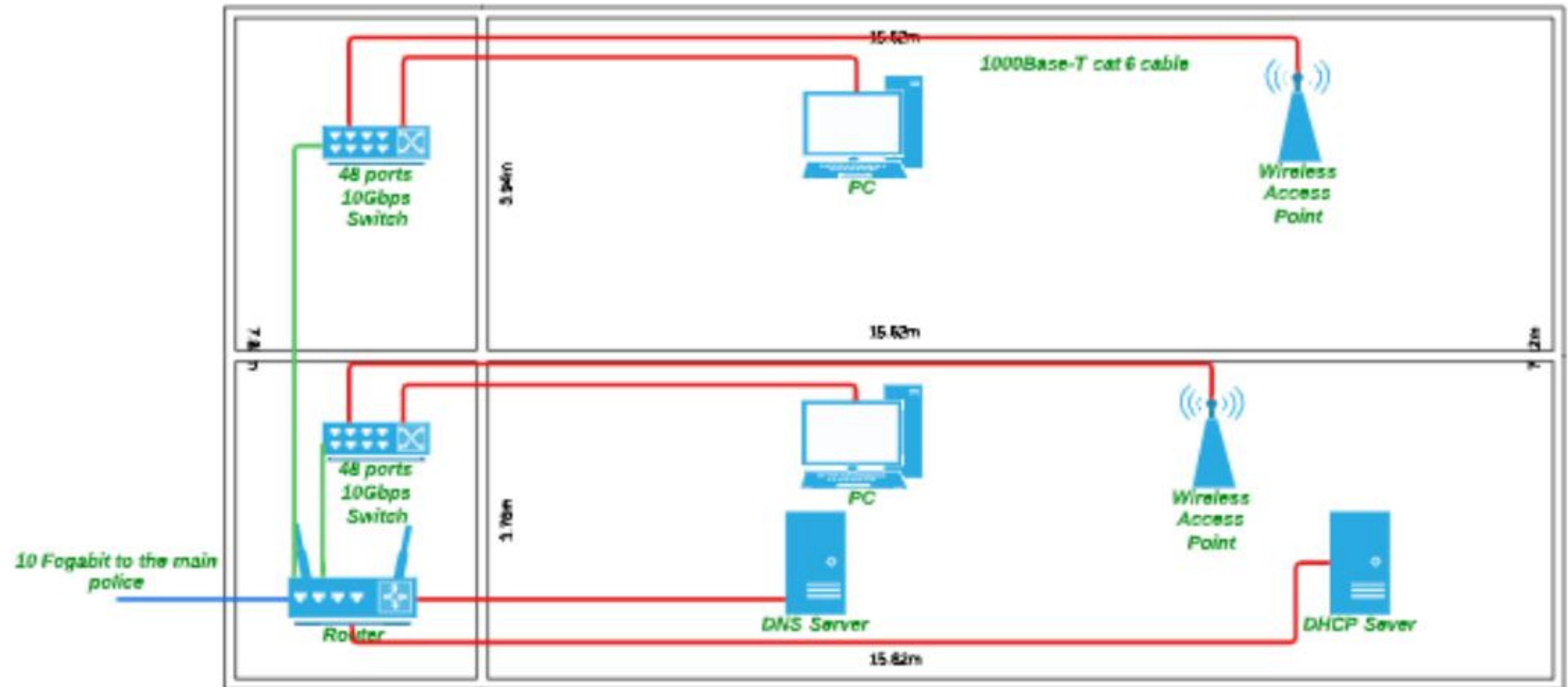12 wireless access points

1 10Gbe router
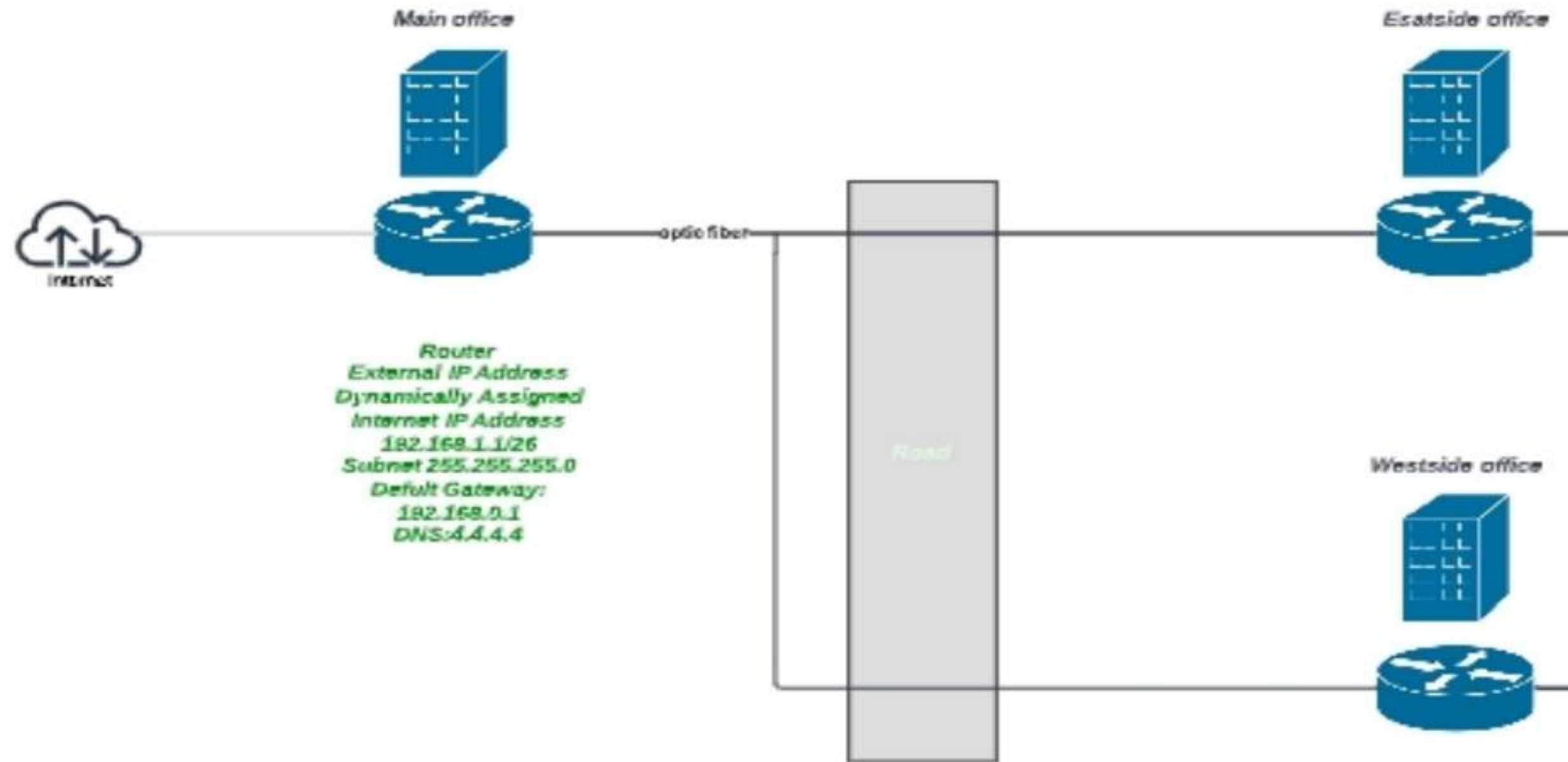
1 DNS server

1 DHCP server

134 50m category 6 cables

5 100m 10Gbe optic fibers

Backbone Network Plan

Proposed network plan for connecting the building to the main office.

Quote

A Comprehensive and Efficient Method of Network Configuration for Micro-Services Based on SDN". Applied Sciences, 11(6), 2873.
Zhang, R., & He, W. (2018). "Design and Implementation of SDN-Based Network Management and Control System for Cloud Computing". International Journal of Distributed Sensor Networks, 14(6), 1550147718779826.
Design and implementation of network security gateway based on Cisco ASA". Journal of Ambient Intelligence and Humanized Computing, 9(4), 1225-1234.
Software-defined networking (SDN) and network function virtualization (NFV) integration for enterprise and service provider networks: a review"