To: Alonzo Brandon, Vice President for University Advancement

From: Eric Preston, Student

Date: March 12, 2025

Subject: Changing from a 10Base-T to a 1000Base-T Standard

Introduction

Old Dominion University's Constant Hall has been running on a 10Base-T Ethernet standard for some time. While that standard is technically functional, for there to be more utility from the building and further growth with the staff and student populations, it would require improving the standard to ensure better connections and access to current applications. Current networks also require faster Ethernet standards to meet the demand of modern applications, showing further benefit to a potential change.

Project Proposal

I am proposing a project that will change Constant Hall's current 10Base-T standard to a modern 1000Base-T Standard. This project will include two blueprints that lay out the cabling and necessary hardware. The first blueprint features Unshielded Category 6A Cabling totaling $12,070.79, and the second blueprint's hardware includes keystone jack faceplates, RJ45 outlets, patch panels, workgroup switches, and a core switch totaling $7,500.31. The result of these blueprints is a project budget of $19,571.10.

Financial ROI Analysis

To determine the return on investment for this project, variable assumptions about the upgraded network usage, response time, productivity, and saved costs will be made, but the current maintenance costs will remain a constant. The formula for this analysis will be in this form: ROI = Total Annual Revenue – Project Cost/Project Cost * 100%.

Network Usage and Response Time:

- There will be a combined 300 students and faculty workers
- 75 requests are made by every person each day
- Delay times are reduced by 10 seconds with the upgrade
- The total amount of workdays for all people will be 260 days each year
- Average wage estimate of both parties will equal $70 per hour

300 * 75 * 10 * 260 = 58,500,000 seconds or 16,250 hours

Multiplying by 70 will equal $1,137,500 in value from less delay

Improved Connections:

- The amount of saved time per day from this upgrade for each user will be 10 minutes

(10/60) * 300 * 260 * 70 = $910,000 in value from better connections

Reduced Support Cost:

- Human IT support for this new network will be reduced by 60 hours per year, and their wage will be $60 an hour

This metric can save $3600 annually

Final Calculations:

1137500 + 910000 + 3600 = $2,051,100 = Total Annual Revenue

2051100 – 19571.10/19571.10 * 100 = 10380.25% = ROI

Additional Benefits

Excluding the monetary value and ROI from the analysis, there are other benefits from upgrading to a 1000Base-T Ethernet Standard:

- A 10Base-T standard has a transmission speed of 10 Megabits per second, but a 1000Base-T standard has a rate of 1 Gigabit per second, being 100 times faster.
- A faster Ethernet Standard provides access to powerful applications like video conferencing or learning resources for students and staff. This also reduces the amount of downtime, load times, and latency that comes with a legacy standard.
- While the initial investment will be costly, making the change sooner rather than later will prevent the initial investment from growing in size, as well as providing technological scalability for the university.

Future Steps

This proposed plan can significantly improve the network infrastructure of Constant Hall but will require further approval for future development. If additional documentation is needed, please let me know. I look forward to hearing from you.

Sincerely,

Eric Preston