Arista Enterprise Switch Replacement Project – Post Report

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Summary

Sicromoft assists clients and developers in implementing AI capabilities, moving workloads to the cloud, and quickly creating and launching apps. Developers can scale portions of their applications thanks to their microservices architecture, which is crucial because it improves speed and reduces downtime. *Maintaining Sicromoft's network architecture is therefore crucial to enabling continuous feature development, reducing downtime globally, and averting any network bottlenecks or possible cyberattacks.* Operating in a highly demanding and performance-sensitive environment, Sicromoft Corp. is a global pioneer in cloud computing, enterprise software, and cybersecurity. *The West Campus region's seven buildings' aging corporate network switches need to be upgraded to preserve its position as a pioneer in innovation and guarantee adherence to the industry's best practices and internal security standards.* Modern, enterprise-grade switches will improve network scalability, speed, and reliability by replacing antiquated hardware.

The project's execution starts with understanding the business and the project's objectives, ensuring alignment among stakeholders, including project managers, developers' managers, network engineers, and data center technicians. Each of the building's network switch upgrades involves constant communications with their developer managers for testing and validation, while providing network engineers with console-based configuration access for migrations and performance monitoring. Datacenter technicians will handle physical installation, cable management, and asset tracking. After gathering all required hardware and providing roles and responsibilities through a kickoff meeting, the project starts with staging the new switches, scheduling downtime to prevent any halts in workload, executing the migration, and updating the required systems. Before transitioning to a new building, validation from the developers will be applied to the switches, including performance checks and communication with developers to ensure stability. Once all buildings have completed their switch replacements, the closing phase will include a final meeting to confirm successful migration, share documentation, and resolve any remaining issues.

After transitioning from outdated, legacy network switches to modern, high-performance network switches, the results were outstanding and showed the expected results. These outcomes include improved network performance with significantly lower latency and faster data transfer speeds, increased uptime and reliability due to a strong new network switch, powerful simplified network management for advanced monitoring and security features, enhanced scalability to support heavy workload and future growth in customers and developers who rely on cloud and system services. These outcomes reduce operational disruptions, ensure consistent high-performance bandwidth, and support always-on business applications.

Review of Other Work

1. A financial tax software provider struggled with poor cloud performance, complex system integrations, limited disaster recovery, and bandwidth throttling due to aging data-center infrastructure caused by legacy network hardware lacking capabilities. However, their supporting company, WEI, modernized their environment with a strong network infrastructure built on HPE Synergy, Aruba switches, Qumolo file storage, and 40GBps networking while maintaining data encryption. This migration reduced their data-center footprint by 10x, delivered almost 95% improvements in database performance, increased bandwidth, reduced latency, and enabled workload scalability without stress and complete failover between their sites. (*Wei. (n.d.)*)

1a. This directly supports my switch migration project as it illustrates the benefits of replacing outdated infrastructure with modern network switches, resulting in high performance and operational improvements. The financial tax software provider's legacy network hardware was the leading cause of their bandwidth throttling, poor cloud performance, and limited disaster recovery, which, unfortunately, are the main issues in outdated and legacy network environments. However, their transition to Aruba high-performance switches and networking achieved faster data output, lower latency, improved scalability, and reliability. These outcomes match the goal of this project: enhancing performance, ensuring network reliability, supporting high workloads, and allowing long-term scalability.

2. A beverage manufacturer's production plan faced a critical issue. This issue was that their industry network was created with outdated switches that caused frequent disruptions to operations, leading to stress on their 24/7 bottling line output. However, with their partnership with Polytron and Cisco, they could deploy industrial-grade switches to ensure zero downtime during a cut-over. With this, their delivery hardened, gaining low-latency and scalable network performance with redundancy and centralized monitoring. As a result, their production plant gained uninterrupted shift operations, improved bandwidth capacity, and created a foundation for future automation and system expansion in their environment, which greatly aligns with our project goal to ensure expansion of our cloud and system environment. (Polytron, Inc. 2018).

2a. This case supports the migration from legacy to modern high-performance switches by explaining the benefit of replacing outdated network infrastructure with industrial-grade, low-latency network switches. The benefits include reduced operational disruptions and continuous production. This manufacturer maintained zero downtime during the migration while allowing scalable bandwidth and centralized monitoring. This reflects our project goal, as our focused outcomes include boosting reliability, performance, and scalability. The manufacturer's successful outcome applies the benefits of upgrading legacy switches to support automation, system growth, and non-stop operations, something we require when expanding our cloud and system environment.

3. Orbitz Worldwide, unfortunately, suffered frequent network outages and performance bottlenecks due to legacy data center switches that can no longer keep track of high workloads and demands. To resolve this issue, they implemented Cisco-brand 8-port 10 Gigabit network modules for their Catalyst 6500 switches, replacing their outdated infrastructure with a high-standard and improved network performance infrastructure. This switch led to a 24/7 global uptime, significantly improved network capacity and reliability, and continued scalability for business growth without operational disruptions. (Cisco Newsroom, 2006).

3a. The example above supports the migration from legacy to modern high-performance projects by showcasing the issue that Orbitz Worldwide faced: critical network instability and performance limitations. However, upgrading their network modules and infrastructure could eliminate outages and meet the increased acceptance of high workloads and demands without disruptions. The successful change aligns with our project goal and objectives: to ensure uninterrupted operations and system growth and to deliver high-performance network capability to support continuous business expansion.

Changes to the Project Environment

Before this project was implemented, the company's current network environment was bottlenecked by legacy, outdated network switches that suffered from high latency, limited bandwidth, and poor reliability, as unreliable switches impacted cloud and system services to developers and consumers. These legacy switches also lacked modern features and old security measures like real-time management, legacy security protocols, and bandwidth throttling, leading to common outages and performance degradation during high workloads. After migrating the legacy to modern high-performance switches, these problems were reduced significantly. The new infrastructure led to faster scalability, lower ping response, and enhanced uptime, resulting in smoother service delivery and greater efficiency to scale for meeting growing demands and high workloads. This brand-new network environment ensured access to cloud and systems services with minimal latency and maximum reliability.

Methodology

We used a structured hybrid project methodology with clear phases to confirm a reliable and smooth migration from legacy to modern network switches. We defined the business and project objectives, ensuring alignment across the main stakeholders, developer managers, network engineers, and data center technicians. This was critical for maintaining coordination, communications, and performance validation across each building being upgraded.

While gathering the requirements, we coordinated with developer managers and their respective teams to understand the network infrastructure needs and finalize resource availability by contacting our supplier, Arista, for the brand-new switches.

Once everything was planned and ready, we initiated a kickoff meeting for our planning phase. From there, we assigned roles and responsibilities to ensure a smooth and reliable migration. We prepared building-by-building project timelines and assigned data center technicians to handle the physical setups, such as labeling, staging, and cable management. In contrast, the network engineers dealt with the pre-configuration and console access setup. Finally, communications between the developer teams, network engineers, and data center technicians were applied to request downtime to ensure production or development was not disrupted.

At the start of the execution phase, we implemented a building-per-phase concept to ensure that not all buildings were disrupted and other buildings could stay working. The data center technicians received the downtime confirmation and could stage and physically replace the switches. They continued to mirror the configurations from the legacy to modern switches, validating and migrating all cables to the new ones. Asset management systems were also updated to reflect the latest hardware changes.

We moved over to the validation phase once all the network switches in the building had been replaced. From there, we monitored the new switches for any performance latency, uptime, and reliability, with confirmations from developers to see if any of their workload was impacted. We proceeded with the following site once the developers confirmed success and provided little to no issues.

After completing all the network switch upgrades in all buildings, we concluded with a closure phase. Our closure phase included a final meeting to discuss feedback, provide documentation for post-migration support, and communicate with all stakeholders to ensure they were satisfied. We were able to agree on the success of the network switches, thus formally closing the project.

Project Goals and Objectives

	Goal	Supporting Objectives	Deliverables Enabling the Project Objectives	Accomplished/Not Accomplished
1.	Analyze and create network assessment from previous network infrastructure	1.a. Understand the previous network infrastructure and layout	1.a.i. Write down the locations and positions of the network switches, especially in a data center environment	This goal has been accomplished, and we were able to complete this section.
			1.a.ii. Count the number of switches needed to replace, to order the number of switches needed. I need approval.	
			1.a.iii. Once you receive new switches, pre-stage them next to their old counterparts for configuration preparation.	
		1.b. Create a pre-configured network configuration from previous network switches	1.b.i Provide console access for network engineers to analyze the legacy network switch	
			1.b.ii. Determine if the network switch still gets updates or any support from the vendor	
			1.b.iii. Replicate the pre-existing network configurations and apply it in a physical storage medium, such as a USB drive.	
2	(PHASE) Migrate from old network switch to new enterprise switch	2.a. Implement pre-configured network configuration to new network switches	2.a.i. Staging and Transfer pre-existing network configuration to the new network switches	This goal has been accomplished, and we were able to complete this section.
			2.a.ii. Allow the network engineers to compare the configurations of the new switch to the legacy	

		2.b. Approval Downtime Request from residing developers per building	2.b.i. Communication with residing developers and managers for downtime approval request	
		2.c. Remove old and install new equipment	2.c.i. Pre-label each network cables, such as what port it originally comes from to ensure proper tracking	
			2.c.ii. Once downtime has been approved, fully disconnect all labeled network cables and power cables and carefully remove the network switch from the network rack.	
			2.c.iii. Implement the new network switch into the network rack and reattach the labeled network cables to their respected location.	
		2.d. Asset/Information Update	2.d.i. For tracking purposes, remove the legacy network switch from the asset management and add the new network switch	
			2.d.ii. Notify the network engineer of the MAC address of the new network switch for its VLAN, and network configured to support the MAC address.	
3	(PHASE) Test and validate network condition after replacement	3.a. Configure legacy switches to have its console wiped	3.a.i Provide console access to network engineer to config wipe previous switches	This goal has been accomplished, and we were able to complete this section.
			3.a.ii. Recycle legacy network switches	
		3.b. Validate and test physical and network connection	3.b.i Physically check the cables	
			3.b.ii Test network connection using command tools and work with developers	

The First Goal's Outcome:

The first project goal was **accomplished**. The team thoroughly analyzed and created the network assessment from the previous network infrastructure. The data center technicians could fully pinpoint the

locations and the positions of the network switches, such as their location in the network rack. ***However, the only issue we encountered was the delivery of the network switches, as we expected these to arrive in less than three weeks, but there was a slight delay.*** However, that delay did not prevent us from stopping. Finally, the DCTs and network engineers were able to stage all the switches to their respective locations and managed to replicate the existing network switches. This first goal was a success, and we were ready to start the full migration.

Project Timeline

Project Milestone	Expected Duration (hours or days)	Projected Start Date	Anticipated End Date	Duration of Completion	Actual Project Start Date	Actual End Date
Project Initiation	5 Days	June 23, 2025	June 27, 2025	4 Days	April 7, 2025	April 11, 2025
Project Kick-Off Meeting	1-2 Hours	June 27, 2025	June 27, 2025	1-2 Hours	April 14, 2025	April 14, 2025
Documenting All Needed Switches	1-3 Days	June 30, 2025	July 3, 2025	1 Day	April 15, 2025	April 16, 2025
Purchase New Switches and Arrival	1-3 Weeks	July 7, 2025	< July 28, 2025	3.14 weeks	April 16, 2025	***May 7***, 2025
Stage Switches (Send to its destination)	1-3 Days	July 28, 2025	July 31, 2025	2 Days	May 7, 2025	May 9, 2025
Obtain Pre-Configuration	1-3 Days	August 1, 2025	August 5, 2025	3 Days	May 9, 2025	May 13, 2025
Apply Pre-Config to New Switches	1-3 Days	August 5, 2025	August 8, 2025	2 Days	May 14, 2025	May 16, 2025
PHASE 1 – STUDIO A and STUDIO B						
Request Downtime	1 month / 7 Day Notification for Working Developers	August 11, 2025	September 19, 2025	5 Workdays for all	May 19, 2025	***May 23***, 2025
Downtime	14 Days *per building*	August 15, 2025	September 19, 2025	3 Days split building	May 26, 2025	***May 29***, 2025
Switch Replacements per floor	4-6 Hours/day	August 15, 2025	September 19, 2025	8 hrs/day - 3 Days	May 27, 2025	***May 29***, 2025

Legacy Switch Wipe	1 Hour/day	August 15	September 19, 2025	8 hrs/day - 3 Days	May 27, 2025	***May 29***, 2025
Physical Validation and Performance Test	2 Days	September 15, 2025	September 19, 2025	2 Days includes June 1	June 1, 2025	***June 2***, 2025
PHASE 2 – STUDIO C and STUDIO D						
Request Downtime	1 month / 7 Day Notification for Working Developers	September 22, 2025	October 31, 2025	5 workdays for all	June 2, 2025	June 6, 2025
Downtime	14 Days *per building*	September 26, 2025	October 31, 2025	3 days split building	June 9, 2025	June 12, 2025
Switch Replacements per floor	4-6 Hours/day	September 26, 2025	October 31, 2025	8 hrs/day – 3 days	June 9, 2025	June 12, 2025
Legacy Switch Wipe	1 Hour/day	September 26, 2025	October 31, 2025	8 hrs/day – 3 days	June 9, 2025	June 12, 2025
Physical Validation and Performance Test	2 Days	October 29, 2025	October 31, 2025	2 days including June 12	June 12, 2025	***June 13***, 2025
PHASE 3 – STUDIO E, F, and G (Multiple DCTs)						
Request Downtime	1 month / 7 Day Notification for Working Developers	November 3, 2025	December 12, 2025	4 working days	June 13, 2025	June 18, 2025
Downtime	7 Days/per building	November 3, 2025	December 12, 2025	7 days for all buildings/split team	June 20, 2025	June 27, 2025
Switch Replacements per floor	4-6 Hours/day	November 3, 2025	December 12, 2025	8 hrs/day – 2 days	June 23, 2025	June 25, 2025
Legacy Switch Wipe	1 Hour/day	November 3, 2025	December 12, 2025	8 hrs/day – 2 days	June 23, 2025	June 25, 2025
Physical Validation and Performance Test	2 Days	December10, 2025	December 12, 2025	1 Day	June 26, 2025	**June 26**, 2025

FINAL VALIDATION (ASSET UPDATES, DOUBLE-CHECK)						
Final Check of all switches (includes Phase 3)	14 days (2 days per building)	December 15, 2025	December 29, 2025	5 days	June 27, 2025	July 3, 2025
Project Closure (Final Notes)	1-2 Hours	December 30, 2025	December 30, 2025	End of Day	July 3, 2025	July 3, 2025

Projected Start Project: June 2025 – 6-month duration

Actual Start Project: April 2025 – 2-month duration

Project Timeline Accomplishment/Non-Accomplishments in Details:

The project's projected date and anticipated end date significantly differed from our actual start date and actual end date as we were able to gather more data center technicians and residing from the East Campus of Sicromoft Corp to provide additional assistance to the migration of the switch, which decreased the project timeline and was able to fully complete the tasks within a span of a few months. The network engineers and data center technicians were also notified about this, and a massive notification email was sent across the company. This project was initially supposed to start in the beginning of Summer, however due to multiple data center technicians and network engineers in the East Campus of Sicromoft's requested to be a part of the project, we were able to start a few months early and significantly reduce the time of per phase and provided the outcome and validation as soon as possible. The result we all seek is high network performance, low latency, reliability, and the growing demand for workloads. In the end, we accomplished our project; however, we faced a few minor mishaps, but they were minor issues, and we could perform all the tasks for project completion.

1. **Pre-Phase Timeline Info**
    a. We accomplished our pre-phase (initiation), coordinating perfectly during the kick-off meeting, understanding our roles and responsibilities, and always providing updates and communications. We did not have any issues with interactions between the stakeholders. However, the only problem we encountered during the initiation was that our delivery of the new switches came late.
2. **Phase 1 – STUDIO A and STUDIO B**

   a. We accomplished the following tasks and finished everything. With our non-stop communication between the network engineer and the data center technicians, we could thoroughly coordinate our migration without missing any issues and deliver perfect performance.

3. **Phase 2 – STUDIO C and STUDIO D**
   a. We accomplished the following tasks and finished everything. The only minor issue we faced was validation and testing due to misplaced naming conventions in the network configuration in Studio C. Luckily, a few machines had this issue, and we could give the machines access to the corporate network and conduct testing and validation, resulting in successful and low-latency testing.
4. **Phase 3 – STUDIO E, F, and G**
   a. STUDIO E is considered a bit more time-consuming because this building has many safety hazards and issues, such as wiring mess, tangled wires, and unlabeled wires. This was only for cleanup and double-checking the network cables, making sure no problems may occur before testing and validating. The network engineers were able to complete and test the network switches and make sure no issues were visible during testing and validation. Thanks to the DCTs and Network Engineers who put in the extra time and day to validate physically and logically, we could complete the required tasks. Also, due to STUDIO F and STUDIO G having the least amount of network wiring and configuration, these two buildings were completed faster than Studio E, yet managed to be fully completed early due to the number of network engineers and data center technicians working together.

Unanticipated Scope Creep

Despite this project's early success, we've encountered a few issues with the timeline. For one, we've encountered an issue delivering the new Arista network switches. In the past, we expected to receive any hardware from Arista within less than three weeks. However, a minor disruption in transit occurred, and we had to push a few days. Our second issue was during the migration in Studio C, where we encountered a problem where a few machines had incorrect or misconfigured system names that differed from the network configurations. This was an issue because system names need to match the Ethernet port system names due to port security. Luckily, only a few machines had this issue, and we were able to fix it during physical validation and testing. Our final issue was the switch replacement execution in Studio E because Studio E's network physical infrastructure was disorganized and had multiple hazardous conditions, such as loose cables and trash on the ground, tangled cabling, and other issues. However, we overcame this issue and finished everything, including validation and testing.

Conclusion

The project to upgrade the network switches was successful when assessed against the defined success criteria. The newly upgraded infrastructure presented improved network performance through lower latency and quick response times, as shown below in Appendix B and post-upgrade benchmark testing and validation. The downtime was significantly reduced, with logs confirming consistent system uptime across all West Campus buildings. On top of that, these new modern network switches enhanced the scalability and security, supporting heavy workloads and bandwidth usage. Most importantly, user experience has significantly improved, validated through feedback from developer teams who experienced smooth cloud and system operations and less network congestion. Overall, this project migration has improved the network infrastructure and the developers and consumers relying on high-performance networks, ensuring the best cloud tools and systems are delivered for everyone at Sicromoft Corp.

Reference

Wei. (n.d.). Case Study: Data Center Modernization with HPE Synergy. *https://info.wei.com/case-study-data-center-modernization-with-hpe-synergy-gen*

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Cisco Newsroom. (2006, September 25). *Cisco builds on data center switching leadership*. https://newsroom.cisco.com/c/r/newsroom/en/us/a/y2006/m09/cisco-builds-on-data-center-switching-leadership.html

Appendix A

Pre-Configuration from Legacy to Modern Confirmation

This pre-configuration is related to the project to ensure proper transfer of all its configurations, such as connected devices, VLAN numbers, port numbers, switch names, etc, from outdated to modern network switches. This will prevent any manual configuration when transitioning to new network switches, as this could lead to an extension of the project timeline.

Original Switch Configuration and copying it to a USB drive /mnt/usb1 (showing only the first 6 ports)

```
$ ssh login as: admin
Password:

Welcome to Arista EOS
------------------------------------------
admin@StuB-4801-lusred116an20> enable

admin@StuB-4801-lusred116an20# show version | include Uptime
Uptime: 467 days, 6 hours and 17 minutes

admin@StuB-4801-lusred116an20# show version | include Serial
Serial number: JPE1234Z098

admin@StuB-4801-lusred116an20# show version | include MAC
System MAC address: 00:1c:73:2a:91:6e

admin@StuB-4801-lusred116an20# show interfaces status
Port       Name                 Status       Vlan  Duplex  Speed  Type
Et1        BR001                connected    100    half    100M   10/100-TX
Et2        DUT-BR001            connected    100    half    100M   10/100-TX
Et3        BR002                err-disabled 100    full    1G     10/100/1000-T
Et4        DUT-BR002            connected    100    full    1G     10/100/1000-T
Et5        BR003                connected    100    full    1G     10/100/1000-T
Et6        DUT-BR003            notconnect   100    half    100M   10/100-TX

admin@StuB-4801-lusred116an20# ping 10.178.45.1
PING 10.178.45.1 (10.178.45.1) 72(100) bytes of data.
72 bytes from 10.178.45.1: icmp_seq=1 ttl=64 time=182 ms
72 bytes from 10.178.45.1: icmp_seq=2 ttl=64 time=175 ms
72 bytes from 10.178.45.1: icmp_seq=3 ttl=64 time=189 ms

admin@StuB-4801-lusred116an20# dir /mnt/usb1
usb:/

admin@StuB-4801-lusred116an20# copy running-config usb:backup-config.txt
Copying running-config -> usb:backup-config.txt

Done
```

Implentation of Configuration and after setup, testing latency and ping

```
$ ssh login as: admin
Password:

Welcome to Arista EOS
admin@core-switch01> enable
admin@core-switch01#

admin@core-switch01# copy usb:backup-config.txt running-config
Copying usb:backup-config.txt -> running-config

Done

admin@core-switch01# show running-config | include hostname
hostname StuB-4801-lusred116an20

admin@core-switch01# write memory
Copying running-config startup-config...

[OK]

admin@StuB-4801-lusred116an20# show version | include Uptime
Uptime: 12 days, 4 hours and 17 minutes

admin@StuB-4801-lusred116an20# show version | include Serial
Serial number: JPE36BGUAJX

admin@StuB-4801-lusred116an20# show version | include System MAC
System MAC address: 76:8b:17:ee:a8:a6

admin@StuB-4801-lusred116an20# show interfaces status
Port       Name                 Status       Vlan  Duplex  Speed   Type
Et1        BR001                connected    100    full    1G      10/100/1000-T
Et2        DUT-BR001            connected    100    full    1G      10/100/1000-T
Et3        BR002                connected    100    full    1G      10/100/1000-T
Et4        DUT-BR002            connected    100    full    1G      10/100/1000-T
Et5        BR003                connected    100    full    1G      10/100/1000-T
Et6        DUT-BR003            connected    100    full    1G      10/100/1000-T

admin@StuB-4801-lusred116an20# ping 10.178.45.1
PING 10.178.45.1 (10.178.45.1) 72(100) bytes of data.
72 bytes from 10.178.45.1: icmp_seq=1 ttl=64 time=7 ms
72 bytes from 10.178.45.1: icmp_seq=2 ttl=64 time=9 ms
72 bytes from 10.178.45.1: icmp_seq=3 ttl=64 time=6 ms
```

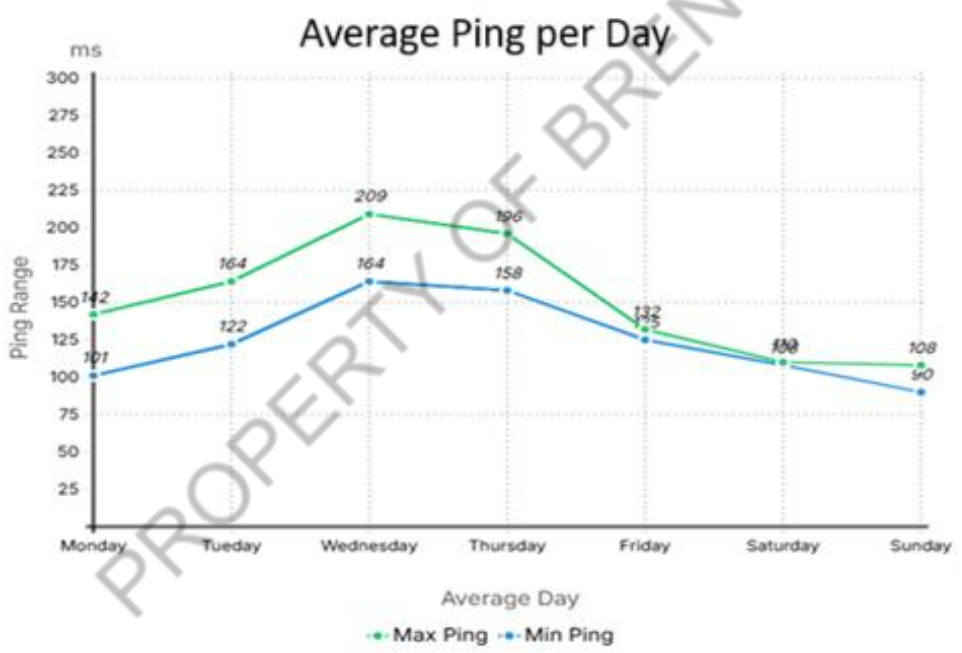
Appendix B

Latency Difference in Monitoring before and after migration.

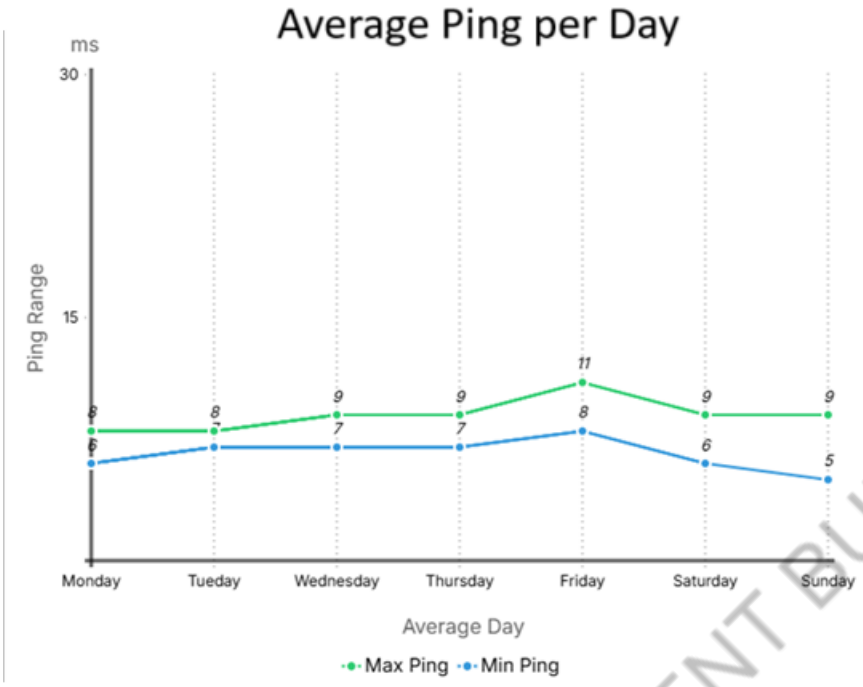
Testing and validation were implemented on the outdated network switch to determine the two-week average latency time and continuous uptime. This is important to the project as our primary goal is to ensure the new network switch will provide low latency for enhanced performance, accessibility, and a reliable user experience.

Two line graphs show the outdated network switch's latency on average over a few days of non-stop uptime and the new network switch's average over a few days after complete migration in all buildings. The first photo showcases the high latency output provided by the outdated network switch, compared to the right, showing the low latency output supplied by the new network switch.

The Outdated Network Switch in all of Studios.



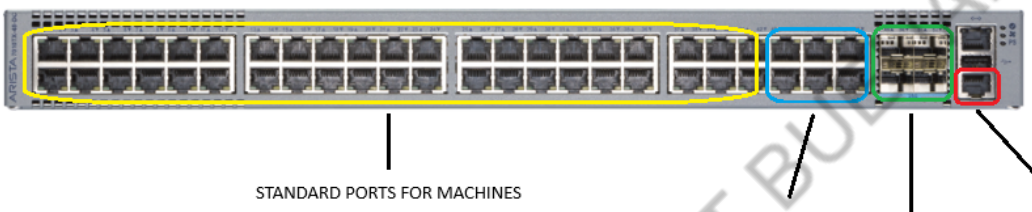
All Studios' New Network Switch upgrade after replacement



Appendix C

Example of the Network Switch Layout to be followed

This is a combination of work between the data center technicians and the network engineers, as data center technicians will work on the physical side. In contrast, the network engineers assist on the logical side. This is an example provided via Excel or a diagram sheet on the layout of the network switch to replicate physically.



For infrastructure ports:

KVM
1. STUB-4801-KVM-1: StuB-4801-lusred116an20 /P43
2. STUB-4801-KVM-2: StuB-4801-lusred116an20 /P45
3. STUB-4801-KVM-2: StuB-4801-lusred116an20 /P47

PDU
1. STUB-4801-PDU-B1: StuB-4801-lusred116an20 /P44
2. STUB-4801-PDU-B2: StuB-4801-lusred116an20 /P46
3. STUB-4801-PDU-B2: StuB-4801-lusred116an20 /P48

UPLINKS TO:

SFP/49 - StuB-4801-lusred116an17
SFP/51 - StuB-4801-lusred116an18

Main Ports:

Odd Ports: BRXXX
Even Ports: DUT-BRXX

The even ports were pre-configured for device under testing. Must be on the even number ports.