



WELCOME!

# Legacy To Managed Lifecycle

## An Infrastructure Story

MARK BYERS AND JASON BOWLING

May 16, 2023



# AGENDA

- Where we started
- Redesign of network
- VOIP migration
- Improve physical and virtual lifecycle
- Evaluate existing services, improve utilization
- Improve reliability and stability, while reducing cost



# NETWORK DIAGRAM, 2016



Photo by Magda Ehlers, Pexels

# THE CHALLENGES

- EOL Cisco gear, out of support
- Network grew organically
- Layer 2 trunks EVERYWHERE
- Fragile and insecure

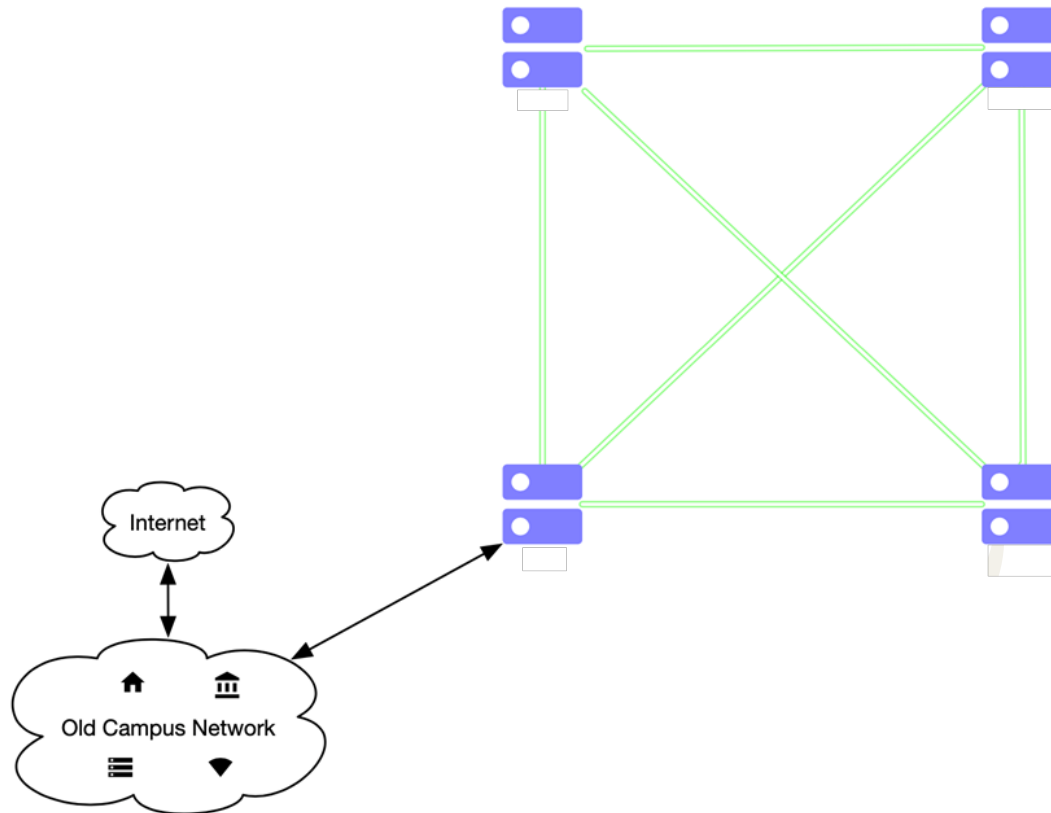


# GOALS

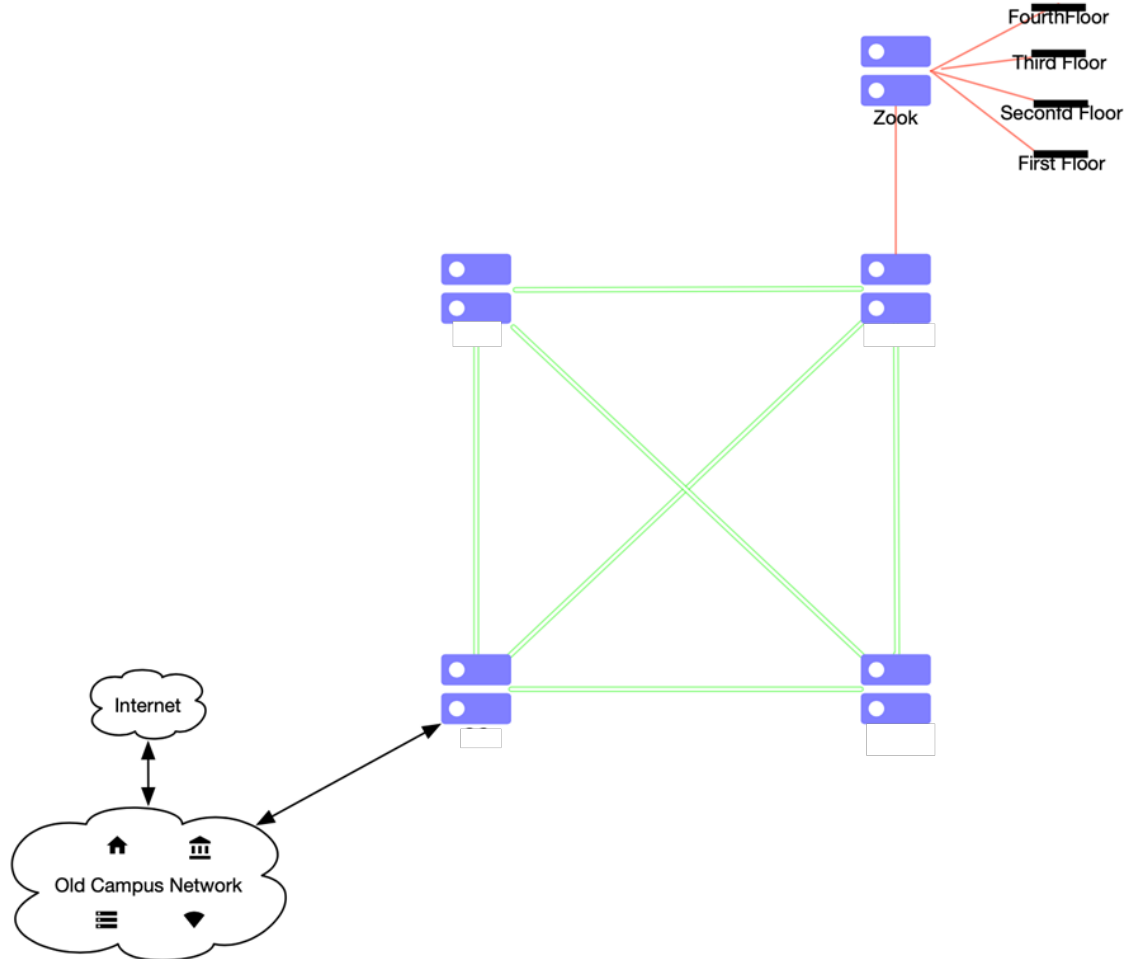
- Commodity, interchangeable hardware
- Standard, open protocols
- Isolation of failure domains
- Private IPs for flexibility



# STEP ONE: BUILD OUT NEW NETWORK IN PARALLEL



# STEP 2: BUILDING ROUTERS



# STEP 3: MOVE USERS AND IOT GEAR

- Dell network was all private
- Unique 10.x addresses for each building
- Routers in each building, connecting edge switches
- Same hardware used everywhere



# STEP 4: VALIDATE NEW AND PRUNE OLD NETWORK

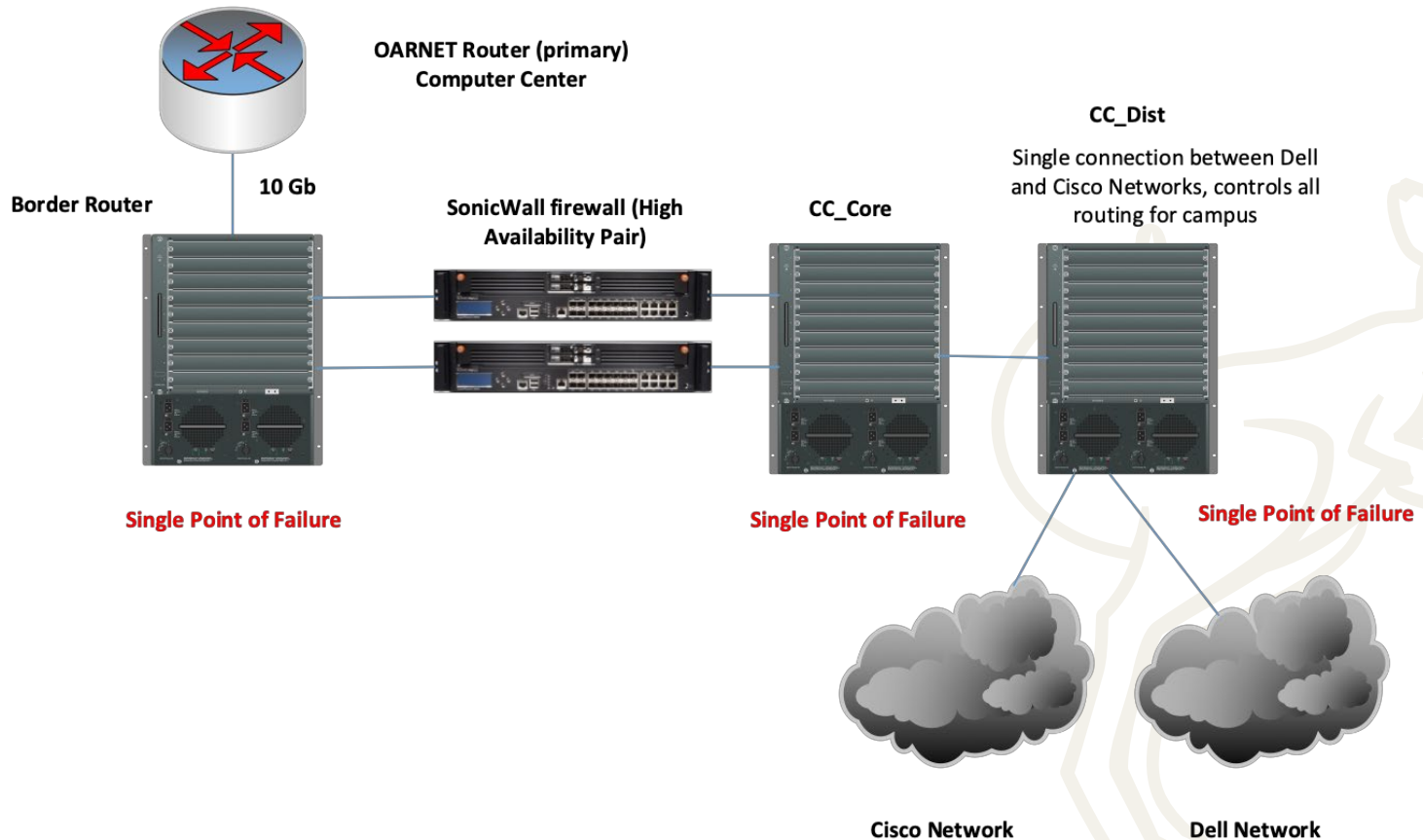
- We had IOT devices that were static addressed, and that was painful
- Some academic departments had special services in the buildings and were migrated to private addresses
- If needed, we moved the original public addresses to the new network

# JUST FOR FUN...

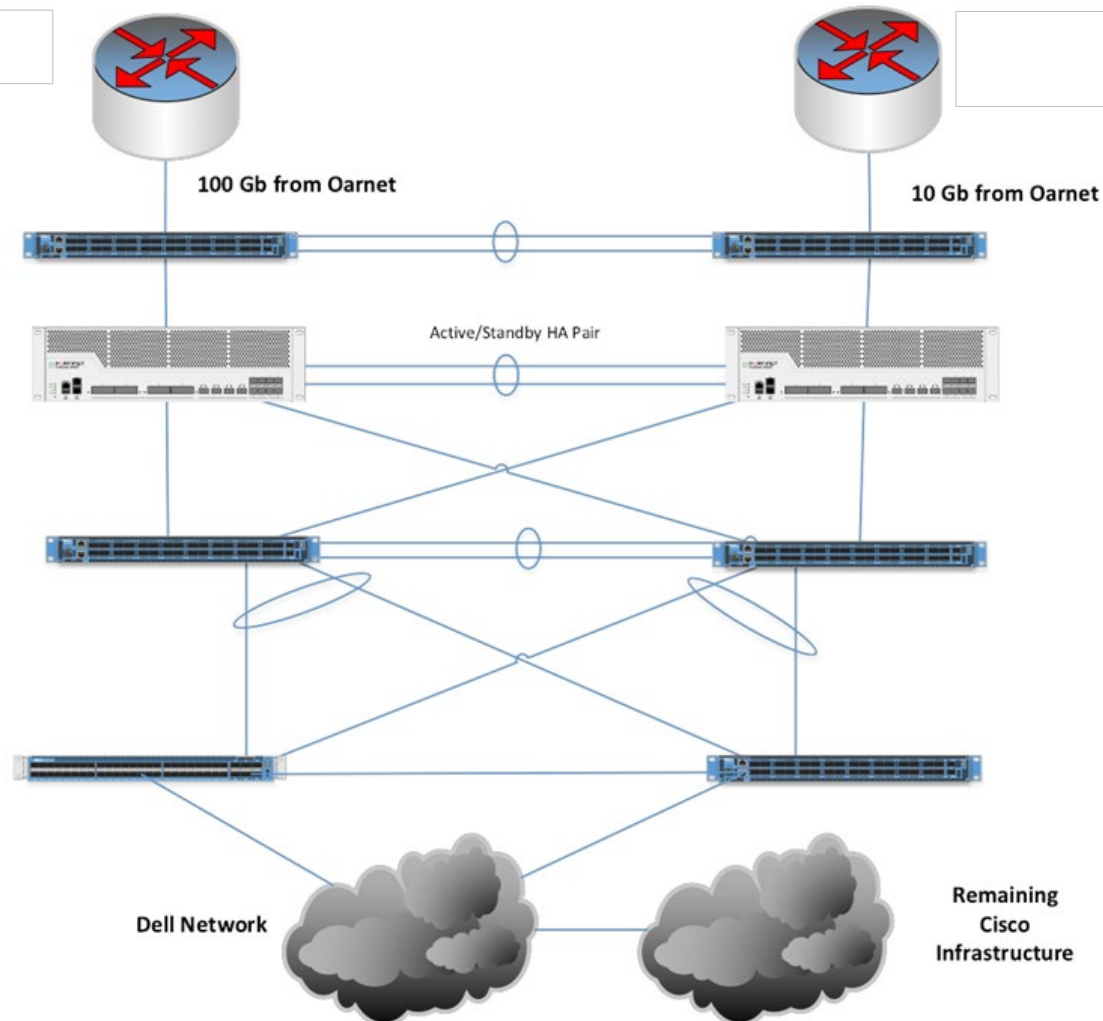
Count the single points of failure.



# YIKES.

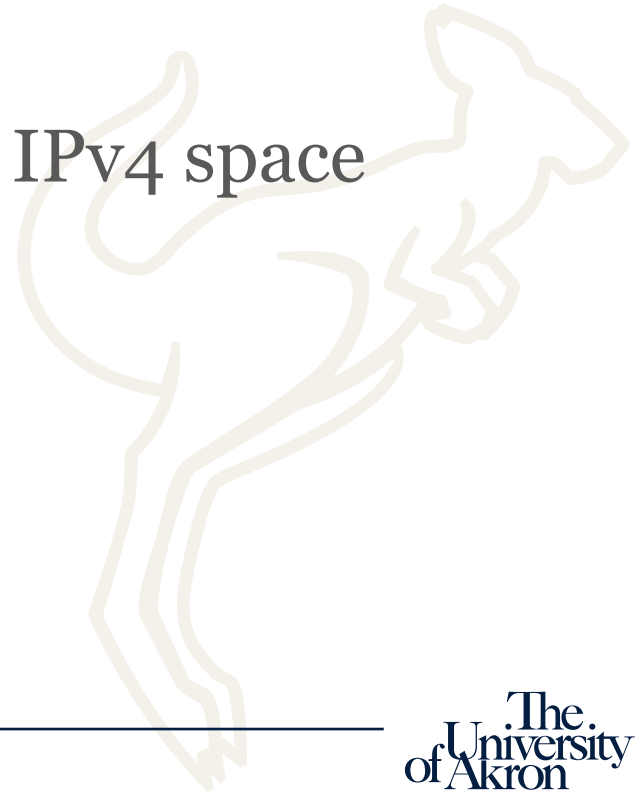


# NEW DESIGN



# BENEFITS

- Collapsed to a small number of public addresses
- Flexibility – enabled sale of our IPv4 space
- Fast troubleshooting
- Common building blocks



# PHONES

- Legacy Avaya system, EOL
- Users migrated to Teams with direct routing JUST PRIOR to January 2020...
- Many, many analog lines remain. That's next.
- Enables flexibility, survivability, remote work



# THE NEXT LAYER

- Lacking consistency and structure, legacy IT debt
- Staffing changes created skills mismatch coupled with FUD
- Security stance was inconsistent
- Core network services considered unreliable
- Lifecycle planning

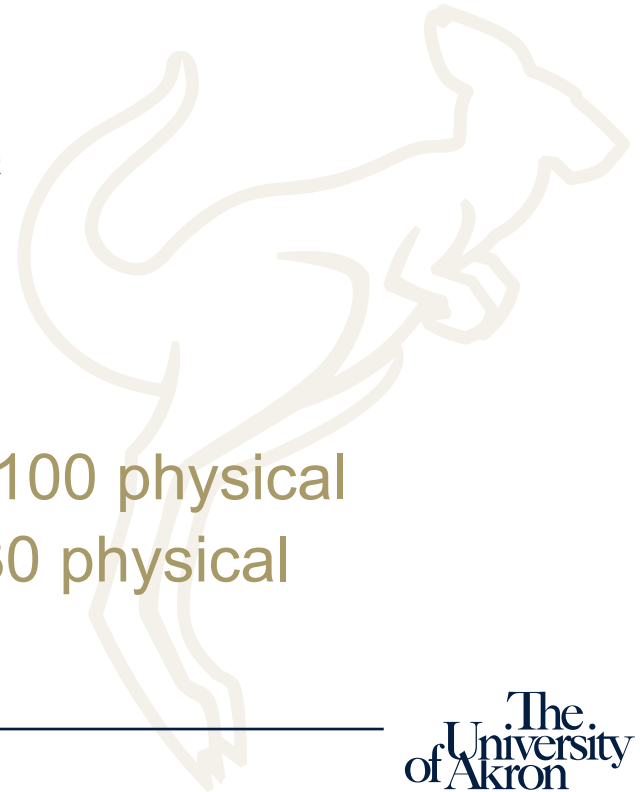
# BUILDING ON THE NETWORK CHANGES

- Move up the IT maturity scale
- Identify architectural changes to improve services
- Align/Improve skills to with current roles
- Right size
- Update lifecycle
- Technical vs cultural



# WORKING TOWARDS LEVEL TWO

- The 5 W's, who, what, where, why and when
- Documentation – What do we have and who "owns" it
- Formal documentation lifecycle
- Monitoring
- Cleanup
  - Started with 500 virtual and over 100 physical
  - Current is 250 virtual and under 30 physical



# CORE SERVICES

- My Internet is not working
  - DNS – domain not replicating correctly, public DNS
  - DHCP – disparate servers, inconsistent
  - Authentication – Azure AD
    - Changed structure for resilience
- E-mail – reputation, spf, dkim, dmarc
- Reduce SMB - OneDrive, SharePoint
- Phones – Full Teams only mode in fall of 2018
- Authentication/Identity management

# UTILIZE WHAT WE HAVE

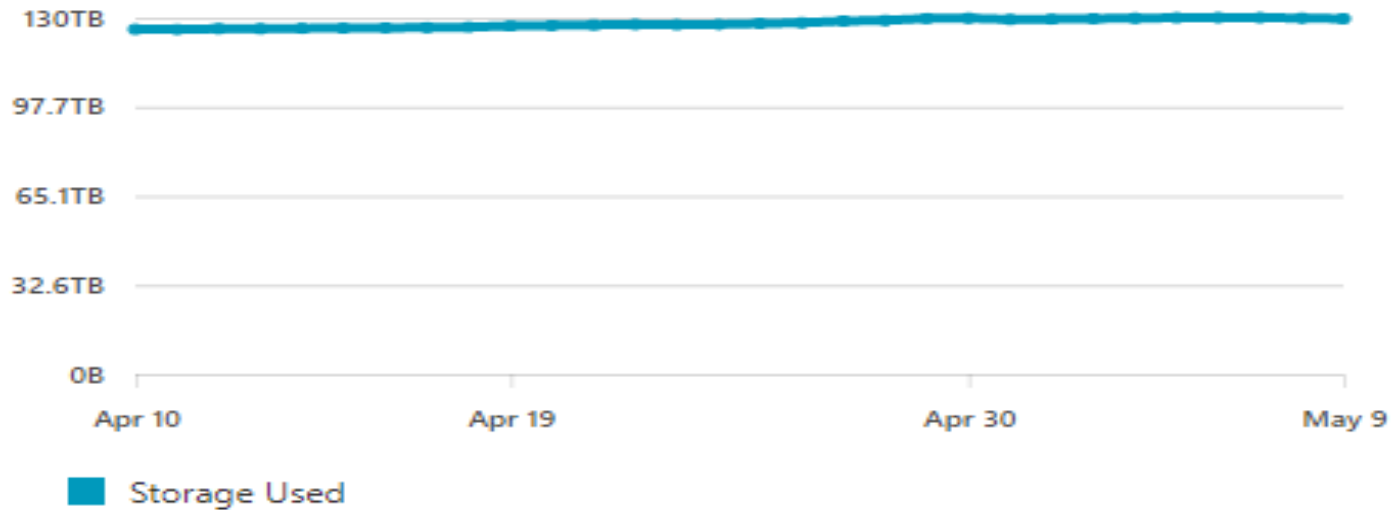
- Migrated from on prem Lync direct to Teams
- Fixing e-mail reputation/security
- Teams expansion and Phone system addition
- Retiring SCCM moving to Intune
- Viva connections portal
- Complimenting ERP system change
- Expand SharePoint Use
- Utilizing OneDrive

# USAGE - ONEDRIVE

## Storage

↓ Export

Amount of storage used



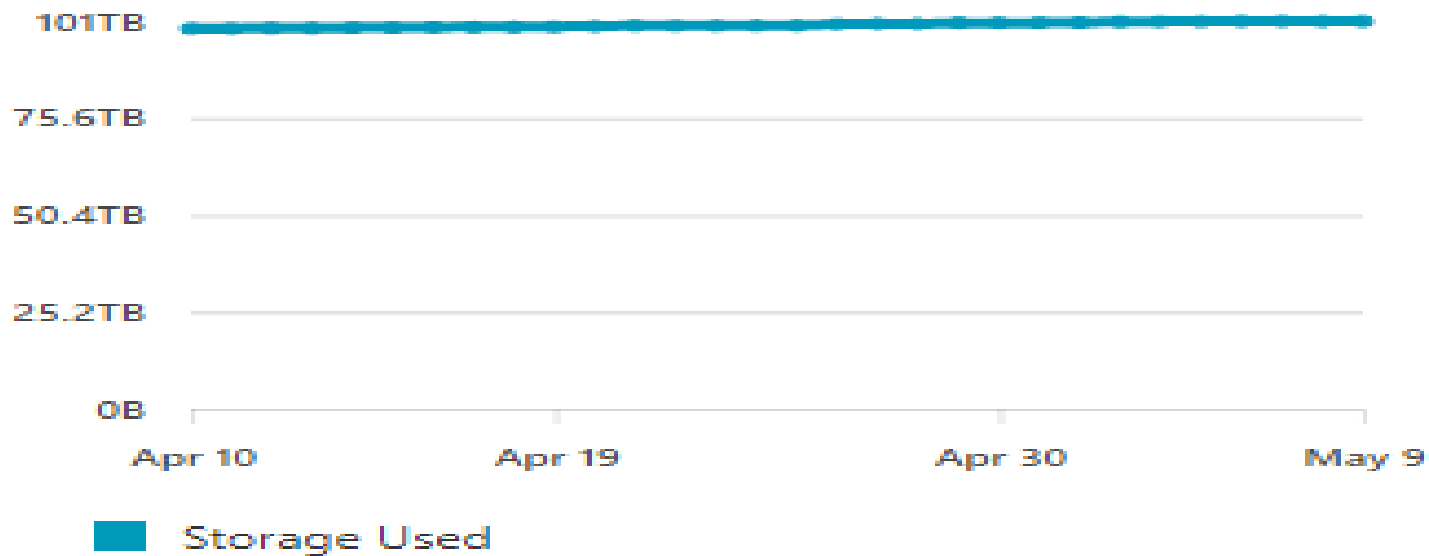


# USAGE - SHAREPOINT

**Storage**

↓ Export

Amount of storage used

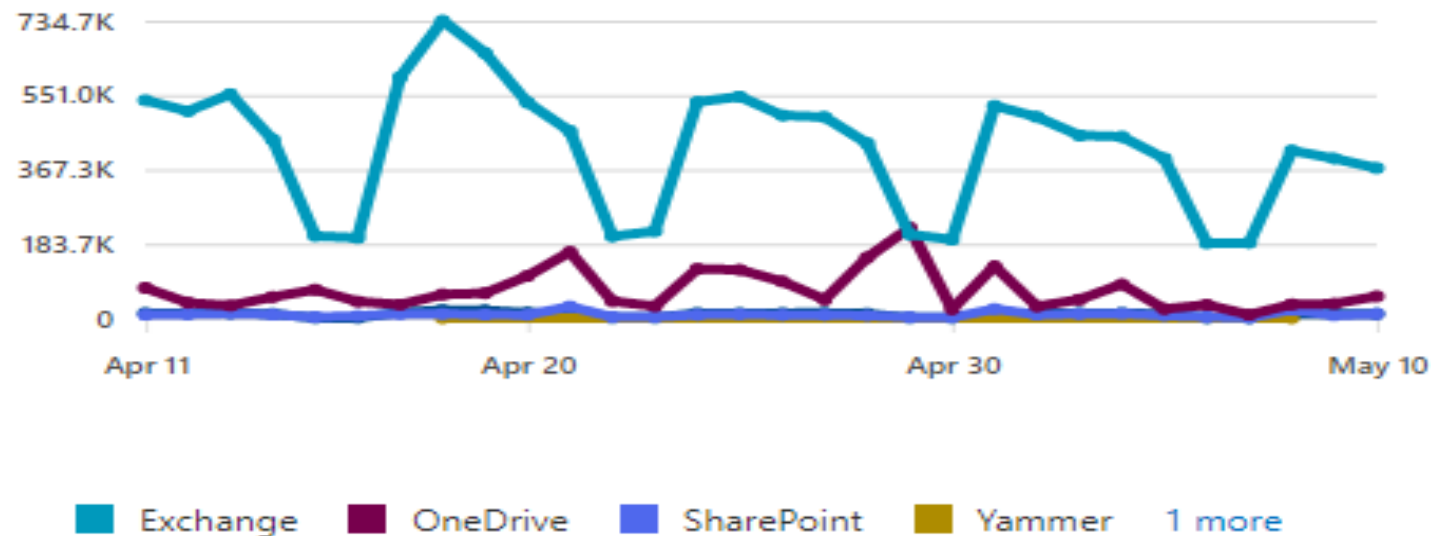


# MICROSOFT 365 USAGE

## Activity

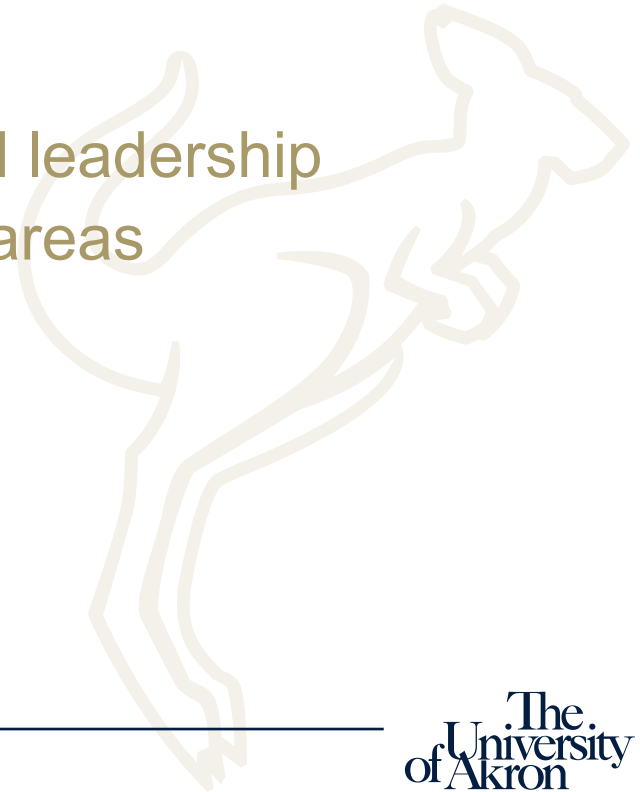
↓ Export

Number of daily activities



# UTILIZE WHAT WE HAVE –PART 2

- Utilizing Defender
- MFA
- Training the team
  - Linked In learning – technical and leadership
  - Connecting admins to additional areas
  - Ownership
- Lifecycle management
  - Hardware deployment
  - Hybrid



# THANK YOU!

