OH·TECH | Ohio Technology Consortium

A Division of the **Ohio Department of Higher Education**

OARnet Member Meeting

OHECC May 22, 2019

OH·TECH

Paul Schopis
Executive Director, OARnet

OARnet Updates

OARnet Fiber Project

Fiber RFP was released in July, 2018 to replace expiring IRU routes.

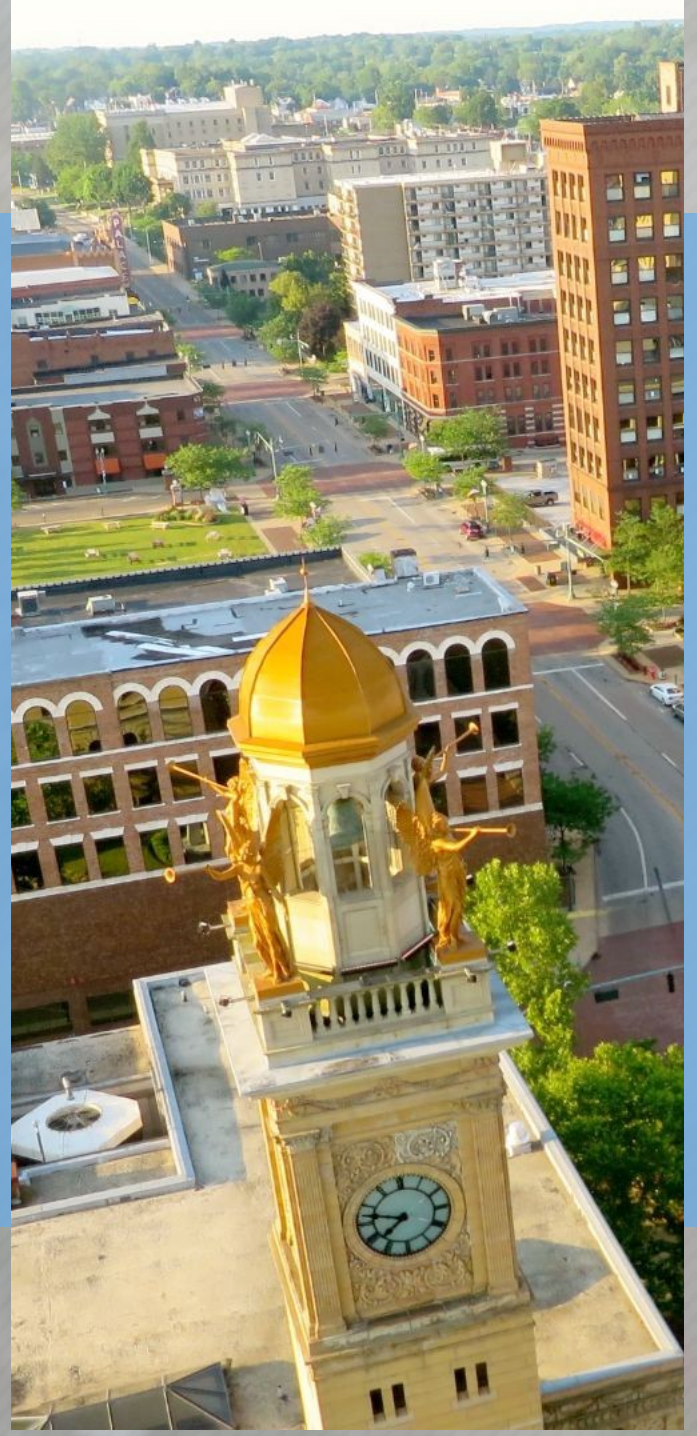
- Level3 routes were previously renewed through 2031
- OARnet met with all vendors for clarification and questions
  - **Final pricing requested on selected route; negotiations on going**
  - Anticipate first round of awards will be for Ring 4 – earliest IRU expiration

Innovation Districts

Innovation Districts. HB233 authorizes cities and villages to create “Downtown Redevelopment Districts” (DRDs) for innovation districts and/or historic rehabilitation.

Canton, OH. Canton is the first Ohio city to establish an Innovation District.

- City is working with Agile, the Hall of Fame (NFL), and several other companies. **Connection established. Met with City and Senator Schuring to map out next phase**
- **Fairlawn seeking similar arrangement with City of Akron**



Connect to Amazon Web Services

OARnet provides the following types of connectivity to Amazon Web Services (AWS):

Peering

The OARnet/AWS 40Gbps public peering in Ohio provides customers with a high-speed, low latency path to us-east-2 public Internet facing services including site-to-site VPN connections.

Available to all members

Direct Connect

A dedicated Direct Connect port enables the extension of a customer's AWS VPC environment to their campus networks through OARnet. This private connection can reduce latency and increase throughput to AWS services.

Case Western, Miami, and Ohio State all connected at 10G

Hosted Virtual Interface (VIF)

OARnet offers a shared, Hosted VIF providing all of the features of the Direct Connect with the flexibility to choose the subscription level that meets customer networking and IT requirements.

Kenyon and OSC in process

Research Opportunities

- **NSF 19-533**: waiting to hear from NSF
  - Category I: Co-PI with Kent State
    - Update NSF asked clarifying questions
  - Category II: PI
    - Capital University
    - Mount Union
    - Tiffin
- **NSF 19-537**: not selected for full proposal
  - Midscale Infrastructure Co-PI
    - Case Western

Financial Updates

FY20 Fee Model Changes

To ensure that member institutions continue to have access to affordable network services, we have developed a more sustainable fee model that will take effect July 1, 2019.

This model was developed over many months through a series of thoughtful and collaborative discussions among representatives of higher education member institutions and the DHE-CIO Advisory Board's Business & Finance Subcommittee.

Fee Model Components

What's Changing? – Beginning July 1, 2019

1 Port Fee (New)

- Low fee for all dedicated ports into an OARnet backbone port
- Includes CPE up to 40 Gig

2 Membership Fee (Modified)

- Includes ports via collector circuits and includes CPE
- Covers IntraOhio traffic
- Value-added services (examples below)

3 Commodity Internet Fee (Reduced)

- Reduced fee with no structural changes to services
- Includes DDoS mitigation

4 Content Fee (Unchanged)

- No structural changes

Please note that these fees do not include last-mile connectivity costs, which remain the responsibility of the customer.

FY20 Fees

Port Fee

Port Size	FY19	FY20
Collector (per Mb)	$ —	$ —
1 Gig - Dedicated	$ —	$ 200
10 Gig - Dedicated	$ —	$ 400
40 Gig - Dedicated	$ —	$ 900
100 Gig - Dedicated	$ —	$ 1800

Membership Fee

Type per FTE	FY19	FY20
Public & Private	$ 1.35	$ 1.00
Community & Technical	$ 0.45	$ 0.77

Commodity Internet Fee

Min (Mb)	Max (Mb)	FY19	FY20
0	999	$ 3.60	$ 2.20
1,000	2,999	$ 2.60	$ 2.00
3,000	9,999	$ 1.90	$ 1.80
10,000	Beyond	$ 1.65	$ 1.60

Content Fee

Type	FY19	FY20
Per Mb, per month	$ 1.00	$ 1.00

Credit Program

As a result of implementing the new fee model, some schools will be adversely impacted. OARnet will review impact based on subscriptions as of July 1, 2019.

FY2020 Credit	FY2021 Credit
70% of Net Increase*	40% of Net Increase*

**Net Increase: Increased costs as a result of applying new fee model to current subscriptions.*

State of Services

OARnet Communities

Serving Ohioans

1,005+
State Gov't Sites
49 State Agencies

74
Local Entity Sites
51 Clients

100
Healthcare Sites
10 Clients

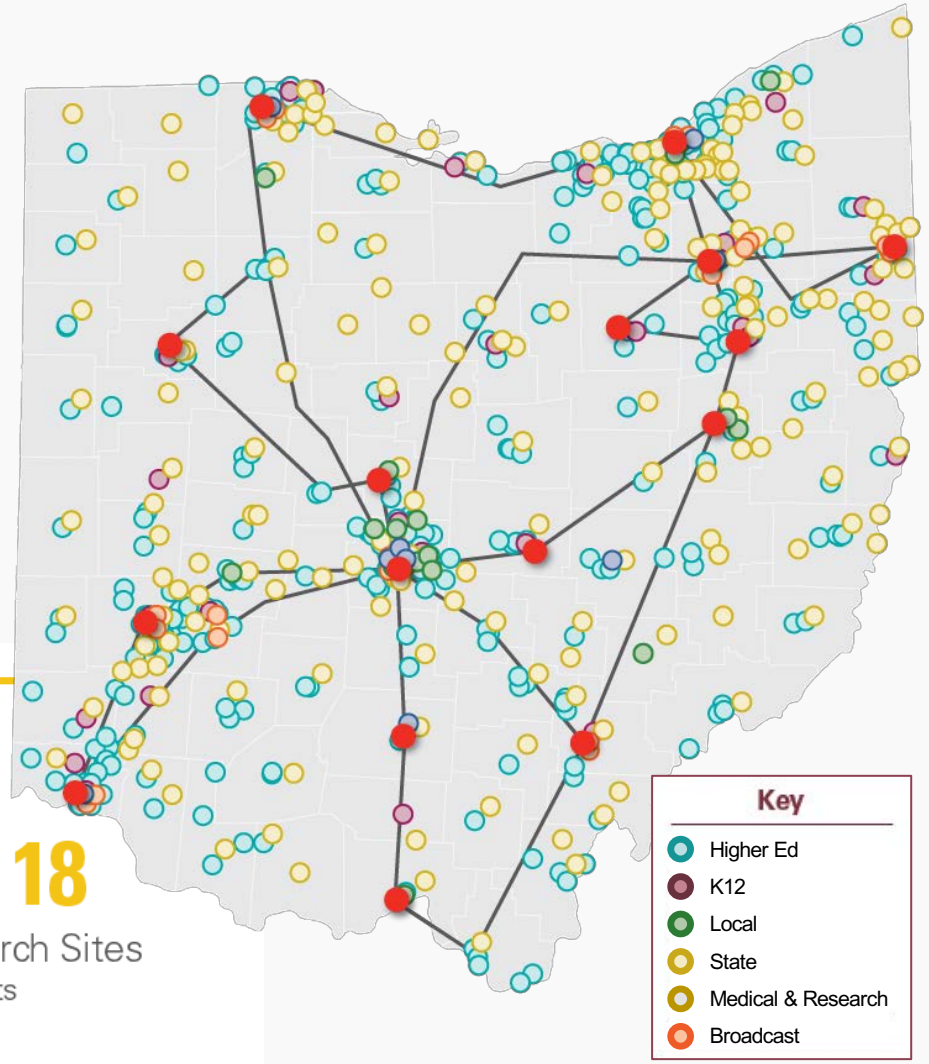
18
Research Sites
11 Clients

630+
K–12 Schools
30 Large Urbans + ITCs
600+ School Districts

345
Higher Education
95 Main Campuses
250 Regional Campuses

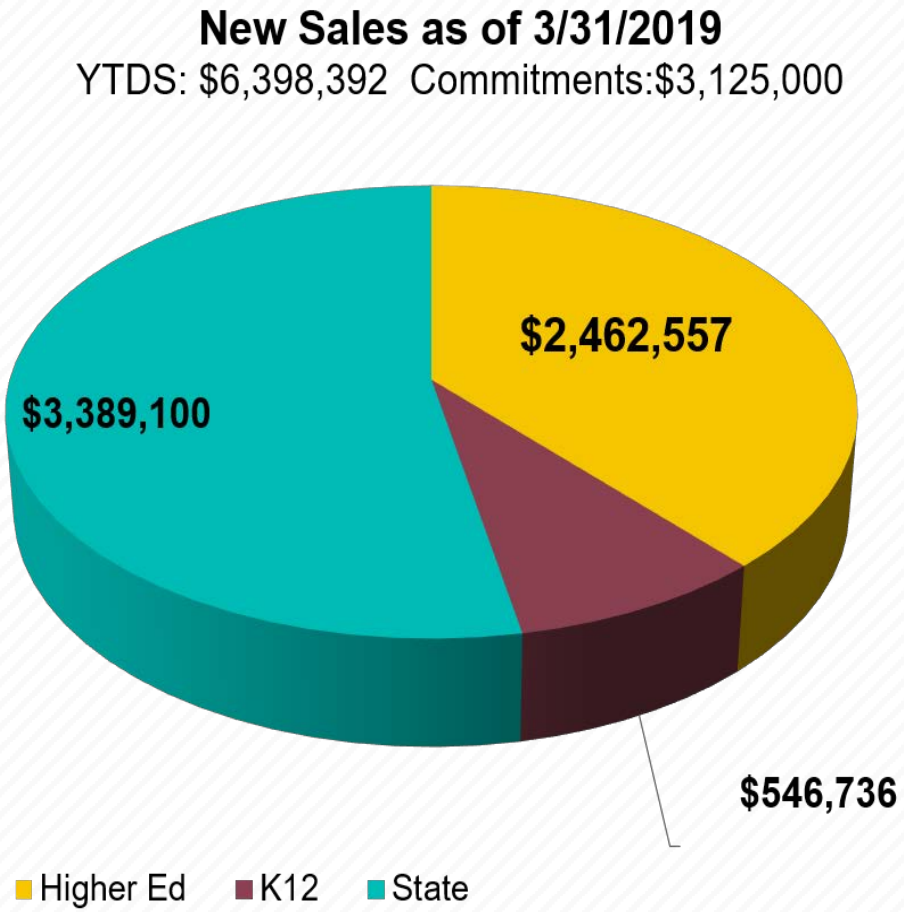
9
Public Broadcasting
9 Stations

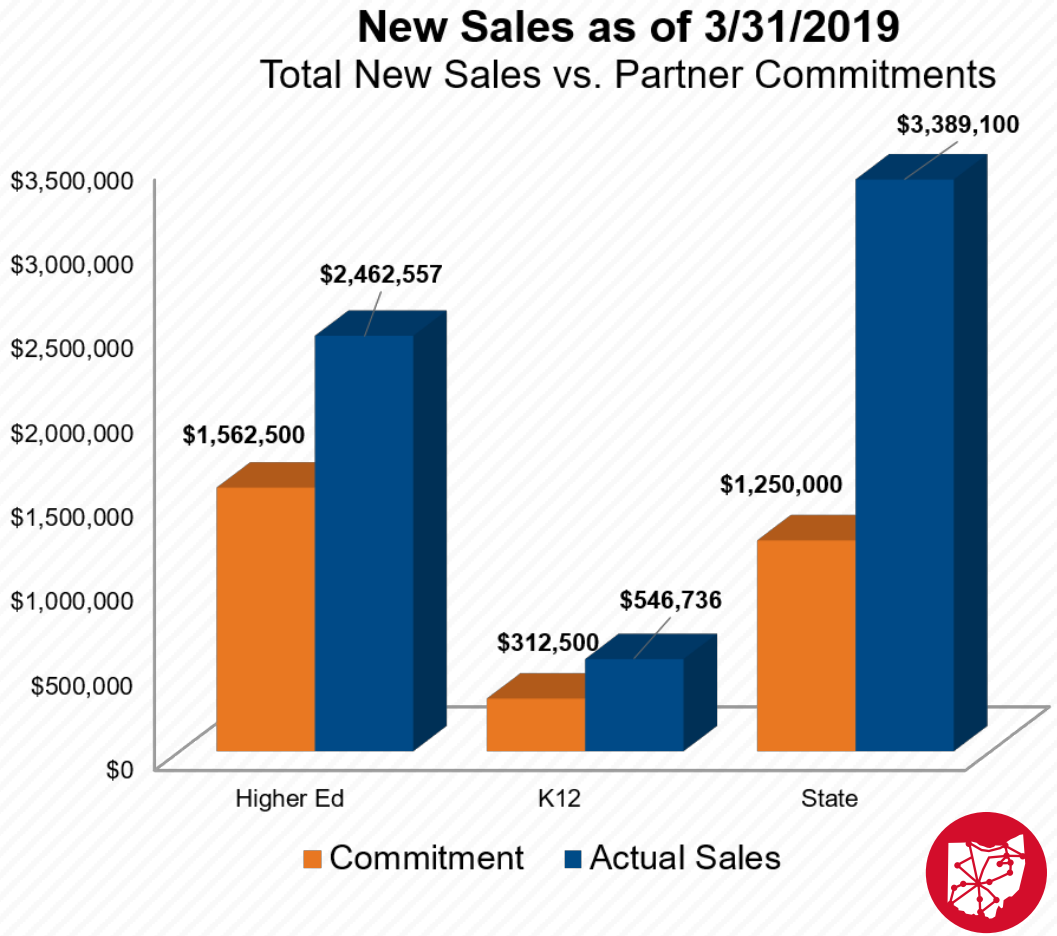
ESInet SERVICE PROVIDER
Supporting NG-911 services for 5 counties, 4 cities and 1 university, with future sites planned

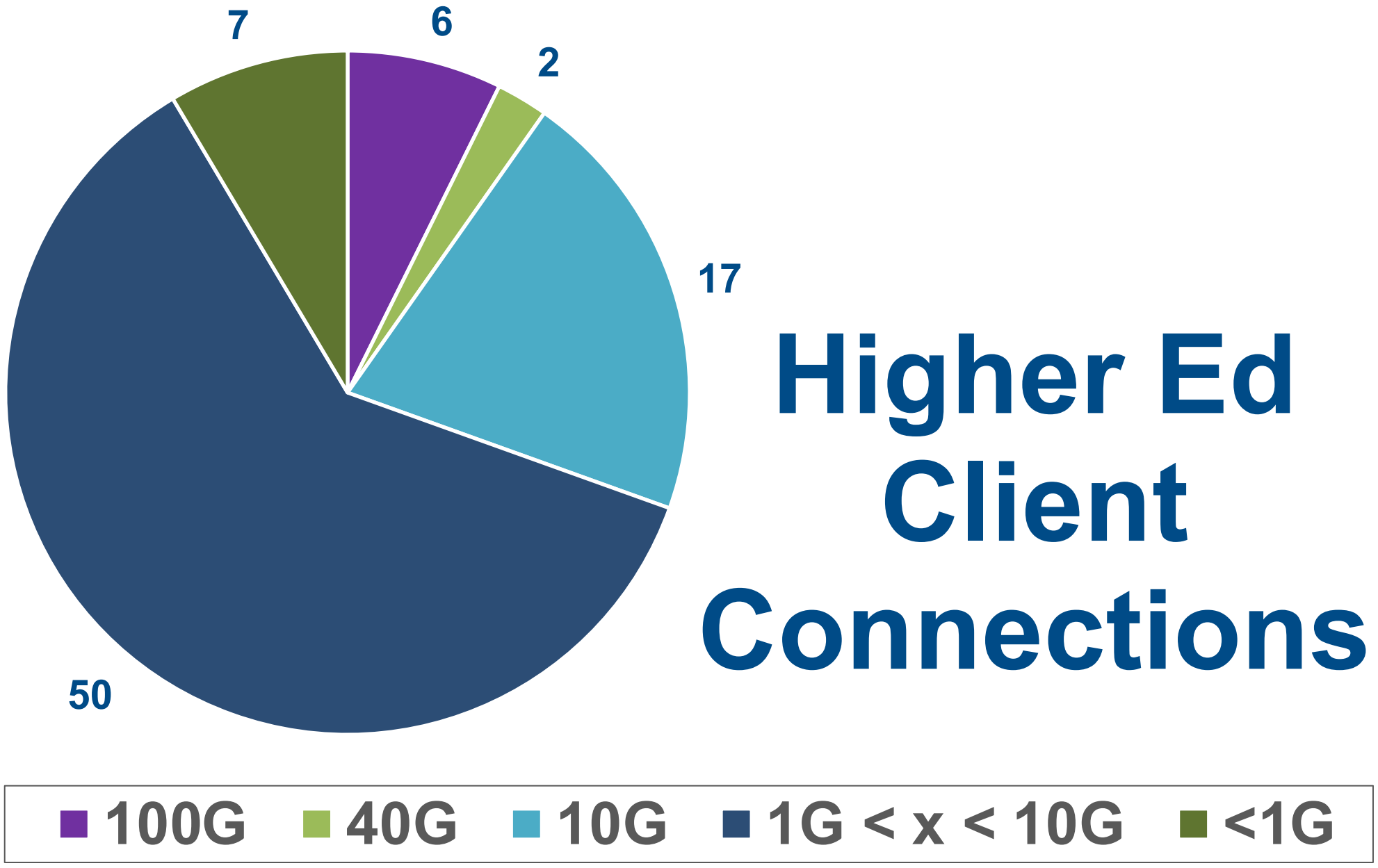


VMware Program Update

VMware Contract Performance through Six Quarters Contract Ends 9/2021

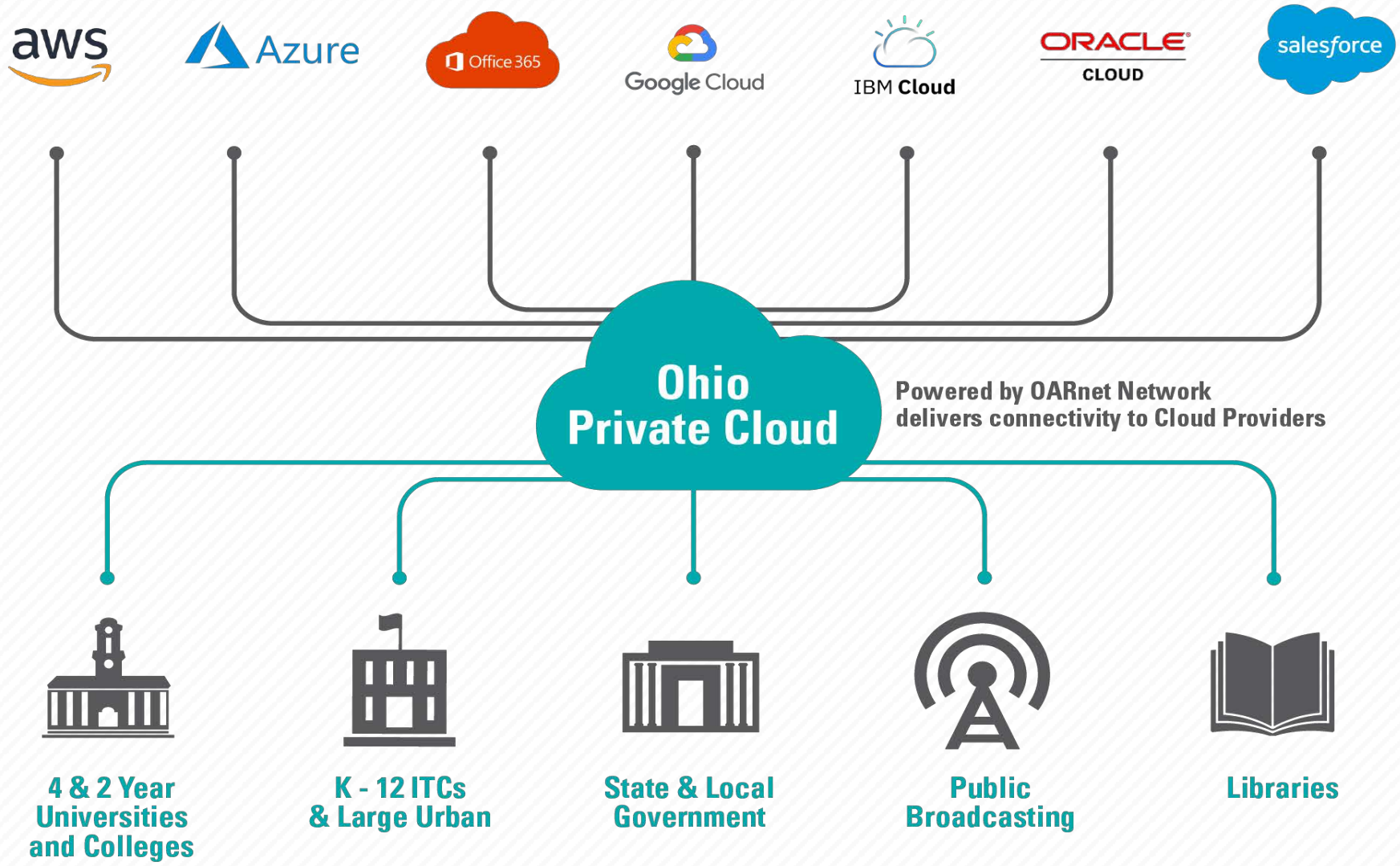




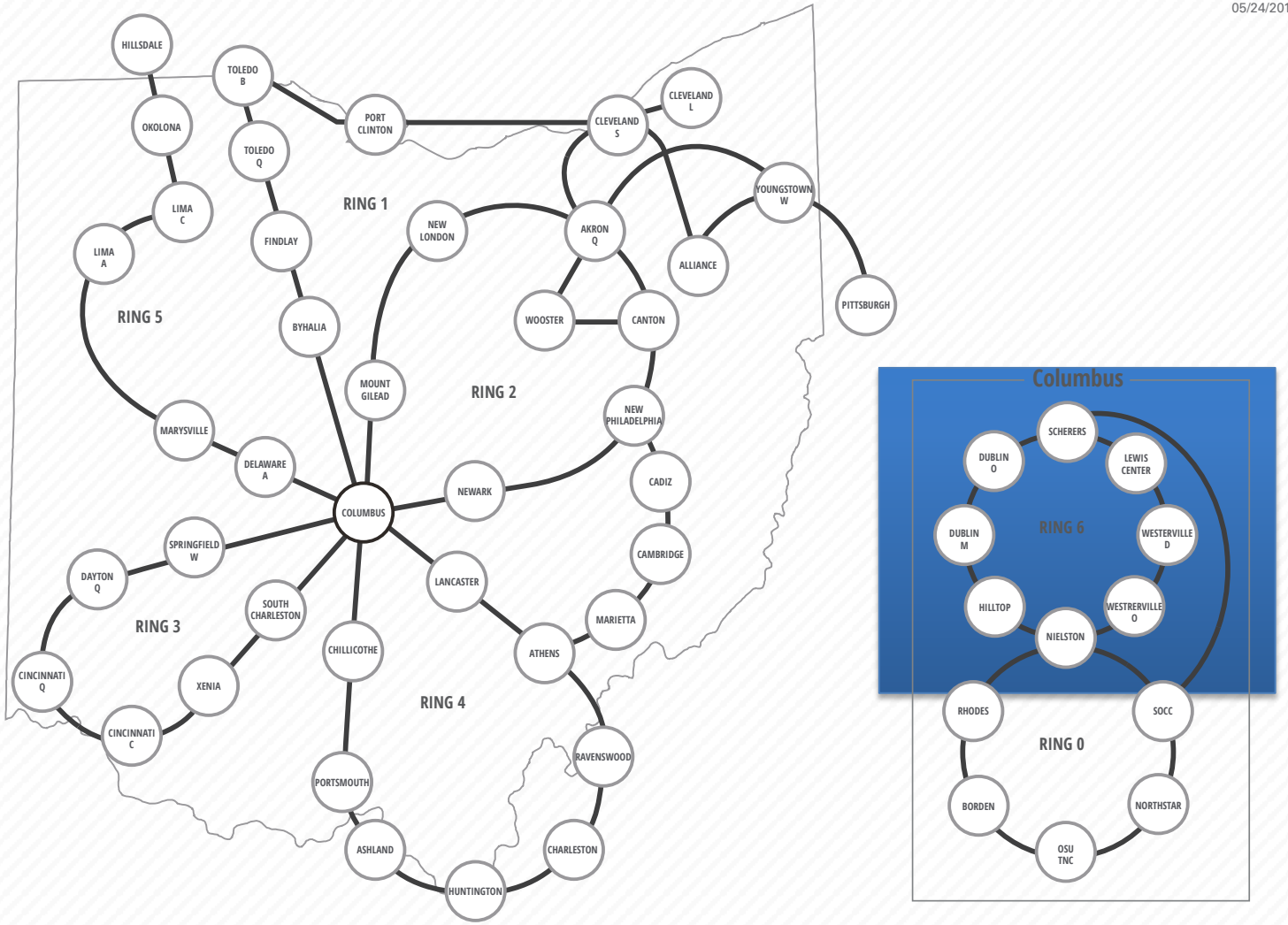


Higher Ed Client Connections

OARnet Cloud Network Architecture



Network Updates



Ring 6 Optical Refresh

Full refresh of all optical transport equipment completed

Lewis Center POP turned down

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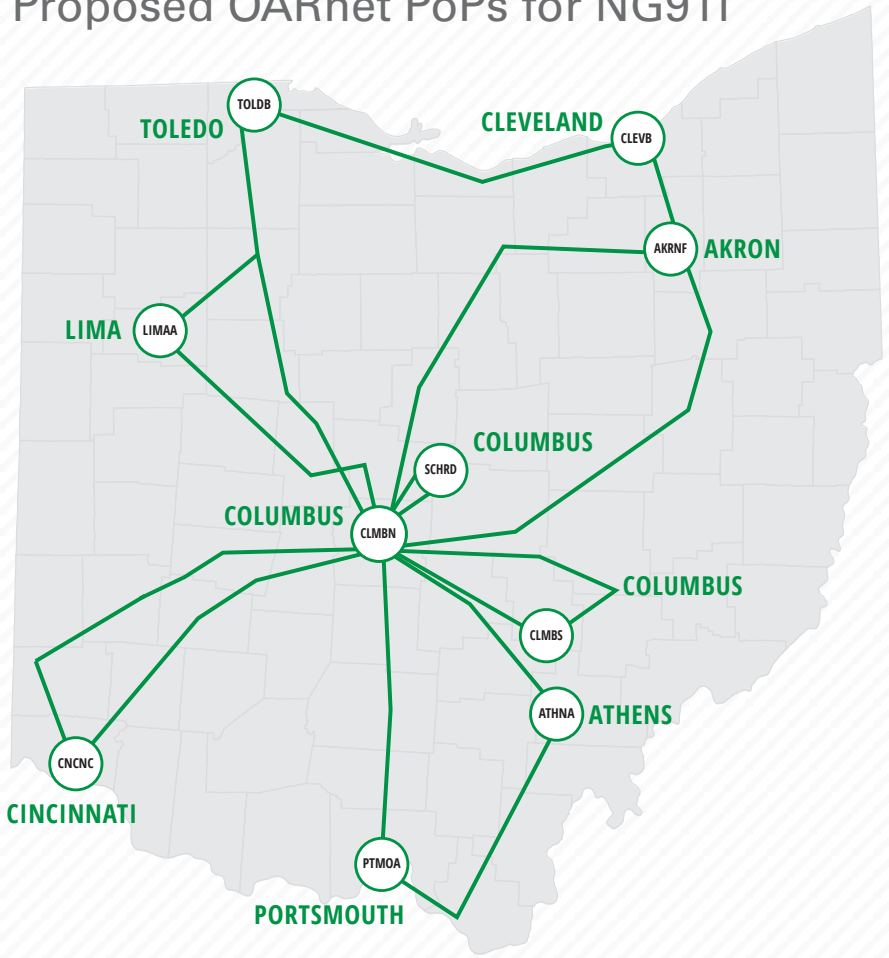
Proposed OARnet PoPs for NG911

as of March 31, 2019



akrnf	Akron First Communications 1 Cascade Plaza Akron OH 44308 (Suite #900)
athna	Athens Zayo 160 W Union St Athens OH 45701 (Ste 179A)
cncnc	Cincinnati Windstream 635 W Mehring Way Cincinnati OH 45202
clevs	Cleveland BlueBridge 1255 Euclid Ave Cleveland OH 44114 (Fl 5)
schrd	Columbus Cologix Data Center 535 Scherers Ct Columbus OH 43085
clmbn	Columbus Neilston 251 Neilston St Columbus OH 43215 (B)
clmbs	Columbus SOCC 1320 Arthur E Adams Dr Columbus OH 43221
limaa	Lima AEP 1688 N Sugar St Lima OH 45801 (Rm 305A)
ptmoa	Portsmouth AEP 800 Gallia St Portsmouth OH 45662 (Fl 5)
toldb	Toledo Buckeye 4818 Angola Road Toledo OH 43615

PoP OARnet PoP — 100g

Emergency Services

Dedicated packet infrastructure for emergency services

Dedicated channels on optical backbone

Supports NG911, MARCS, and City/County emergency services networks

Service updates

New OARnet ServiceNow Instance in production with the following modules in use:

- Incident
- Problem
- Change
- Customer Care Case

Two new GPS-NTP servers in service in Columbus

- Redundant equipment arrived, targeted for deployment in Cleveland

Pre-configured DDoS mitigation: 28 customers connections

Security Updates

Federated Identity Management

InCommon Adoption (30)	
Bowling Green	Oberlin
Case Western	Ohio Northern University
Cedarville	Ohio State
Cleveland State	Ohio University
Columbus State	Owens
Denison	Stark State
Franklin & Urbana	The College of Wooster
Hebrew Union College	Union Institute
Kent State	University of Akron
Kenyon	University of Cincinnati
Lorain County	University of Dayton
Malone	University of Mount Union
Marshall	University of Rio Grande
Miami	University of Toledo
OARnet/OhioLINK	Wright State

eduroam (30)	
Ashland	OARnet
Bowling Green	Oberlin
Case Western	Ohio State
Cedarville	Ohio University
Cleveland State	Otterbein
Columbus State	Sinclair
Denison	Talawanda K12
Franklin & Urbana	The College of Wooster
Hebrew Union College	University of Akron
John Carroll	University of Cincinnati
Kent State	University of Dayton
Lakeland	University of Northwestern Ohio
Malone	University of Rio Grande
Marshall	University of Toledo
Miami	Zane State

Security and Compliance

Threats, vulnerabilities, and attacks are on the rise

- Compliance requirements continue to expand

Current operations meet stringent NIST-based security requirements

- Currently undergoing regularly-scheduled IT controls assessment with OSU Internal Audit

Proactively engaging with trusted third-party experts to identify and remediate any potential areas of emerging risk to the organization

Ohio Cyber Range

An activity of the Ohio Cyber Collaboration Committee (OC3)

University of Cincinnati is the first Core Site for the OCR. **University of Akron** has been selected as the second Core site.

- Future phases will add Regional Programming Centers throughout the State.
- Production capability announced for **Fall Term 2019**
- All sites connect through OARnet.

Looking Ahead

State of OARnet:
Opportunities and Challenges

- Financial horizon looks secure; budget is balanced and reserves will cover IRU renewals.
- Much more integrated with state initiatives
  - Chancellor is on Governor's Cabinet
  - Backbone for State
  - Much wider constituent base
- Completely reliant on State for all Capital Equipment funding
- Direct Operating Subsidy is slight less than flat; however indirect OS is increasing but discretionary

State of OARnet:
Path Forward

- ODHE will appoint Interim Executive Director for 6-12 months
- In parallel, ODHE will commence search for new permanent Executive Director
- Community engagement in selection process

Questions?

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Cloud RULES ...and what matters

Moving to the cloud: real experiences along the way

Getting Started:

What are your strategic drivers for the cloud?

Miami University

Cloud Appropriate
Viable, current datacenter
Strong focus on Agile methodologies for developing and supporting solutions

Notre Dame

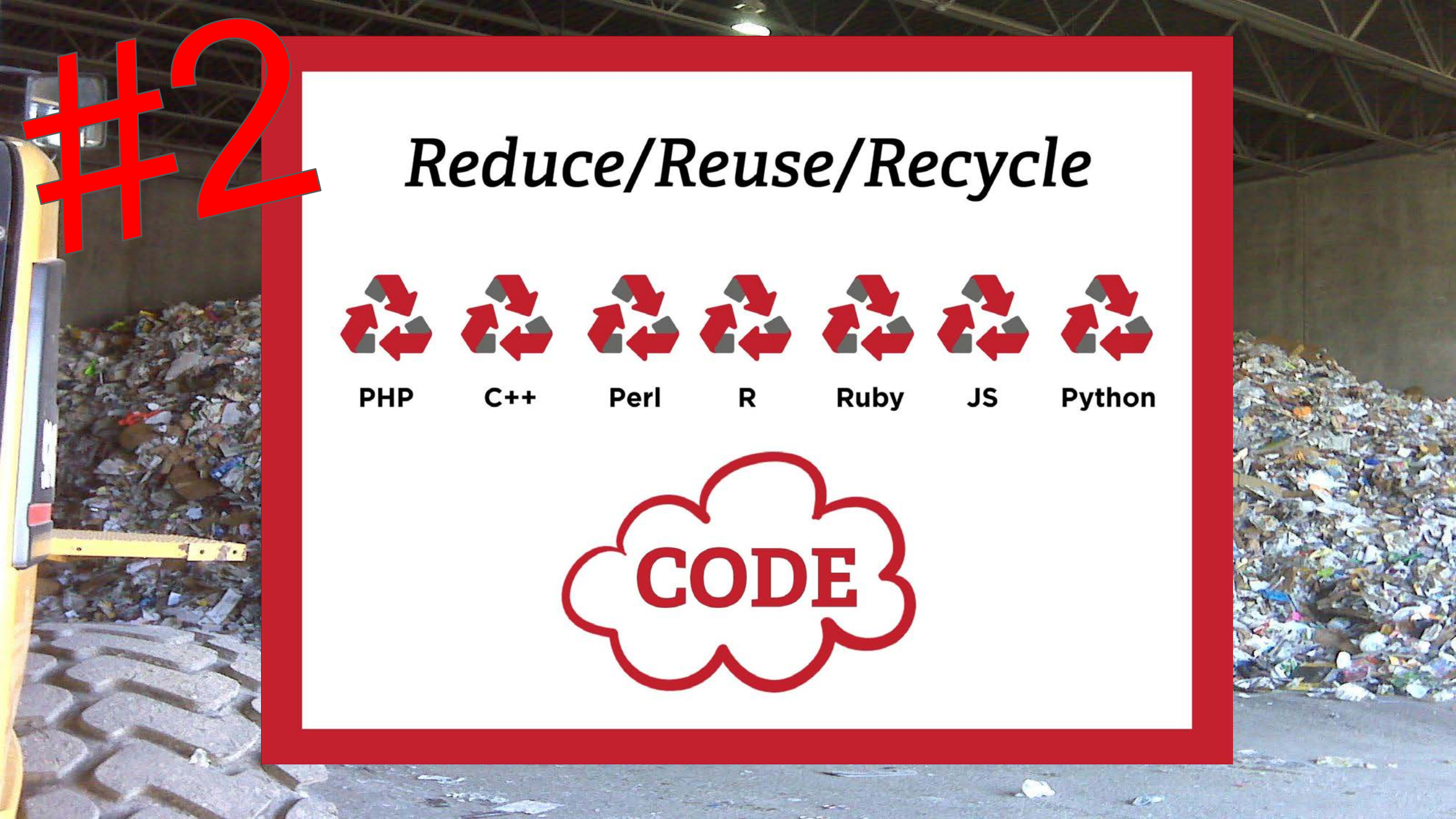
CloudFirst
Full datacenter move from a dying datacenter
Re-designed organization around cloud operations

Cloud

...and what matters

Three rules of cloud infrastructure moves

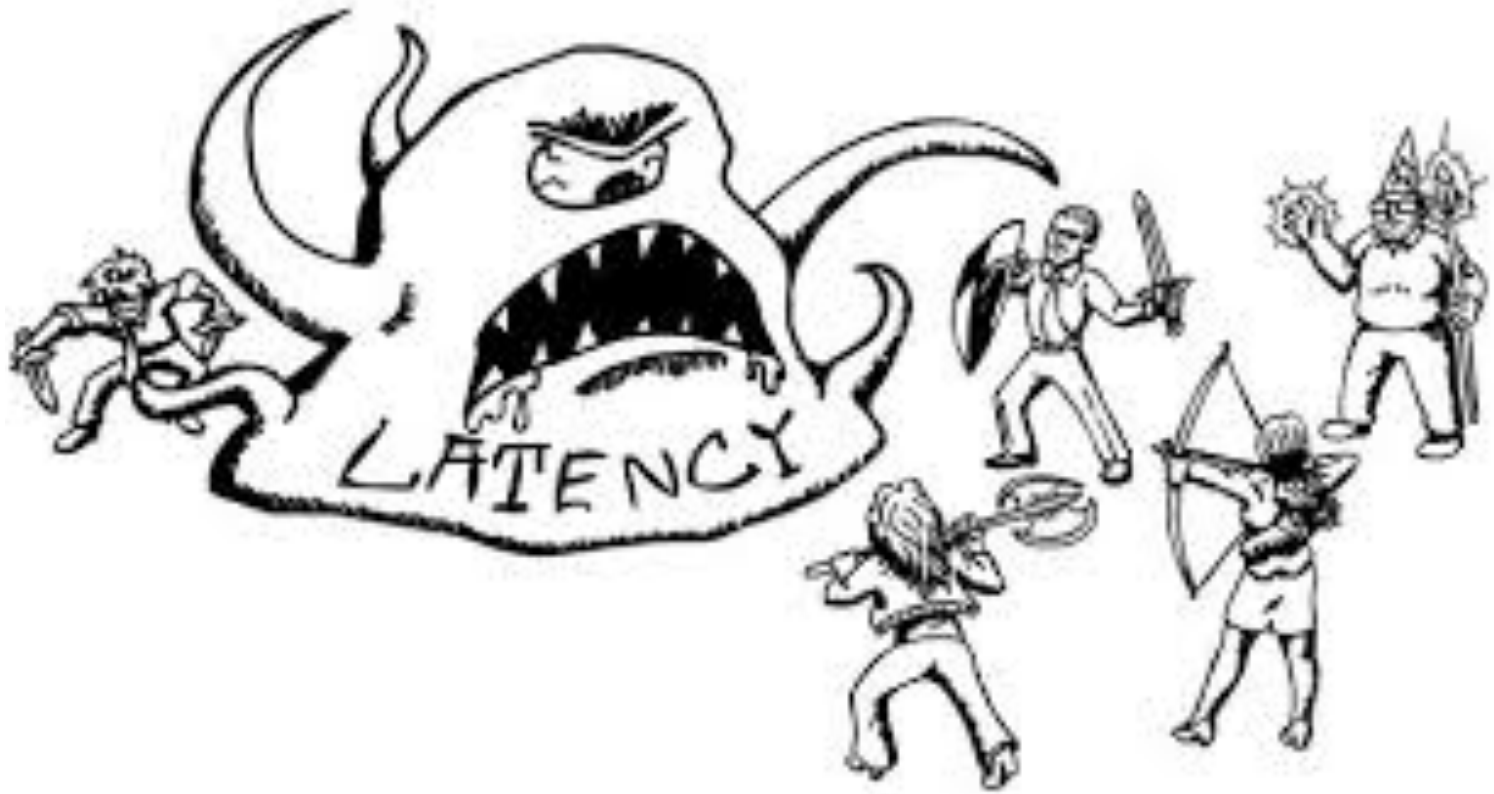
#1
No Forklifting
(or...only intentional, planned forklifting)


#2
Reduce/Reuse/Recycle
PHP
C++
Perl
R
Ruby
JS
Python
CODE

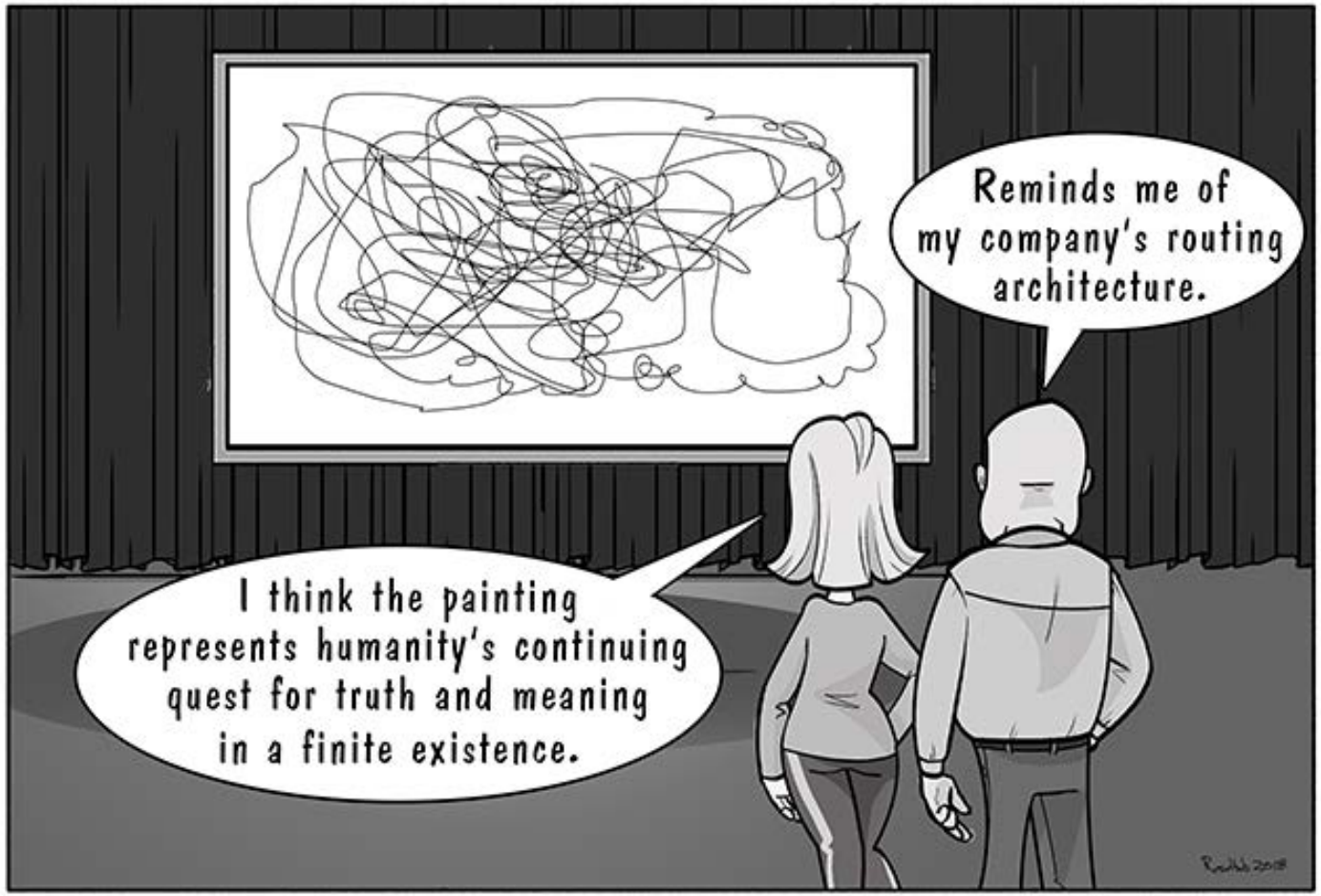
#3

Financial engineering is as important as technical engineering

Five things that matter



Latency matters



Routes matter

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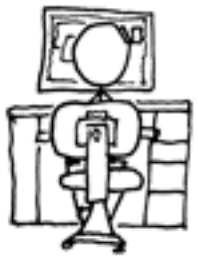
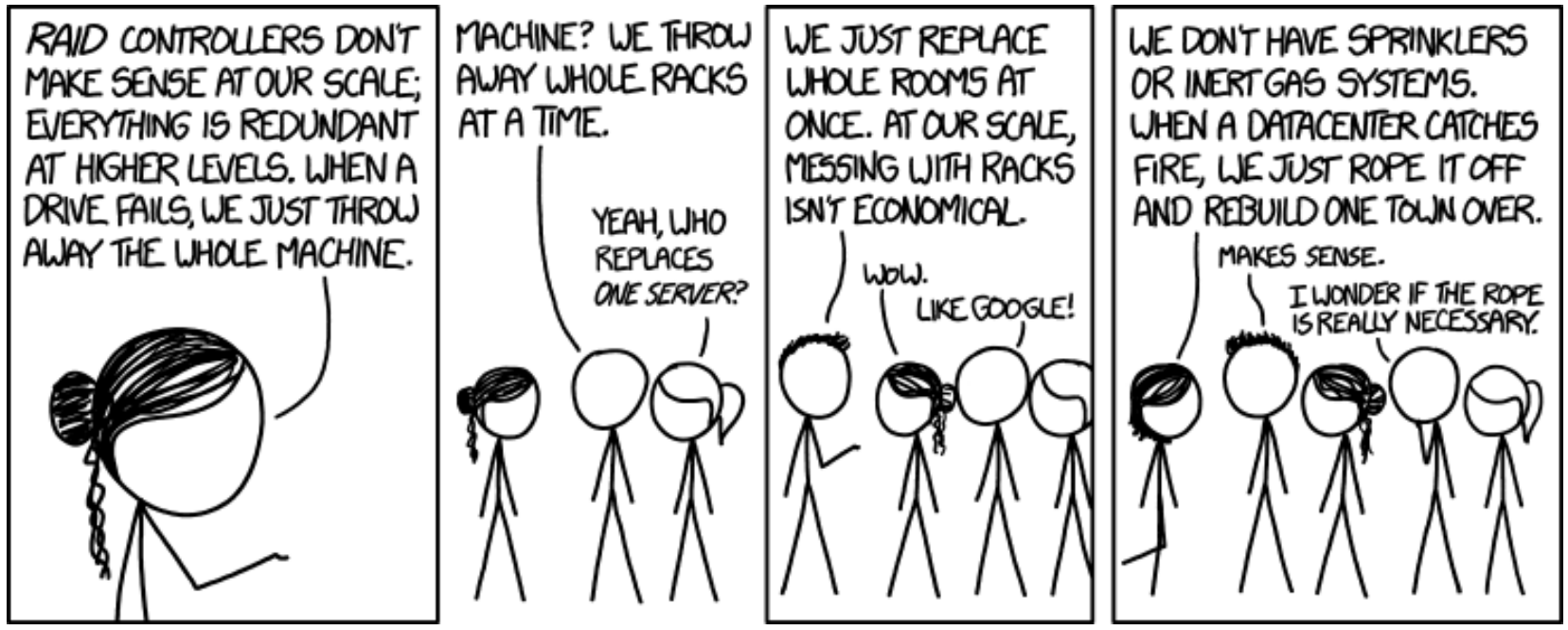
Which is why OARNet matters for us...

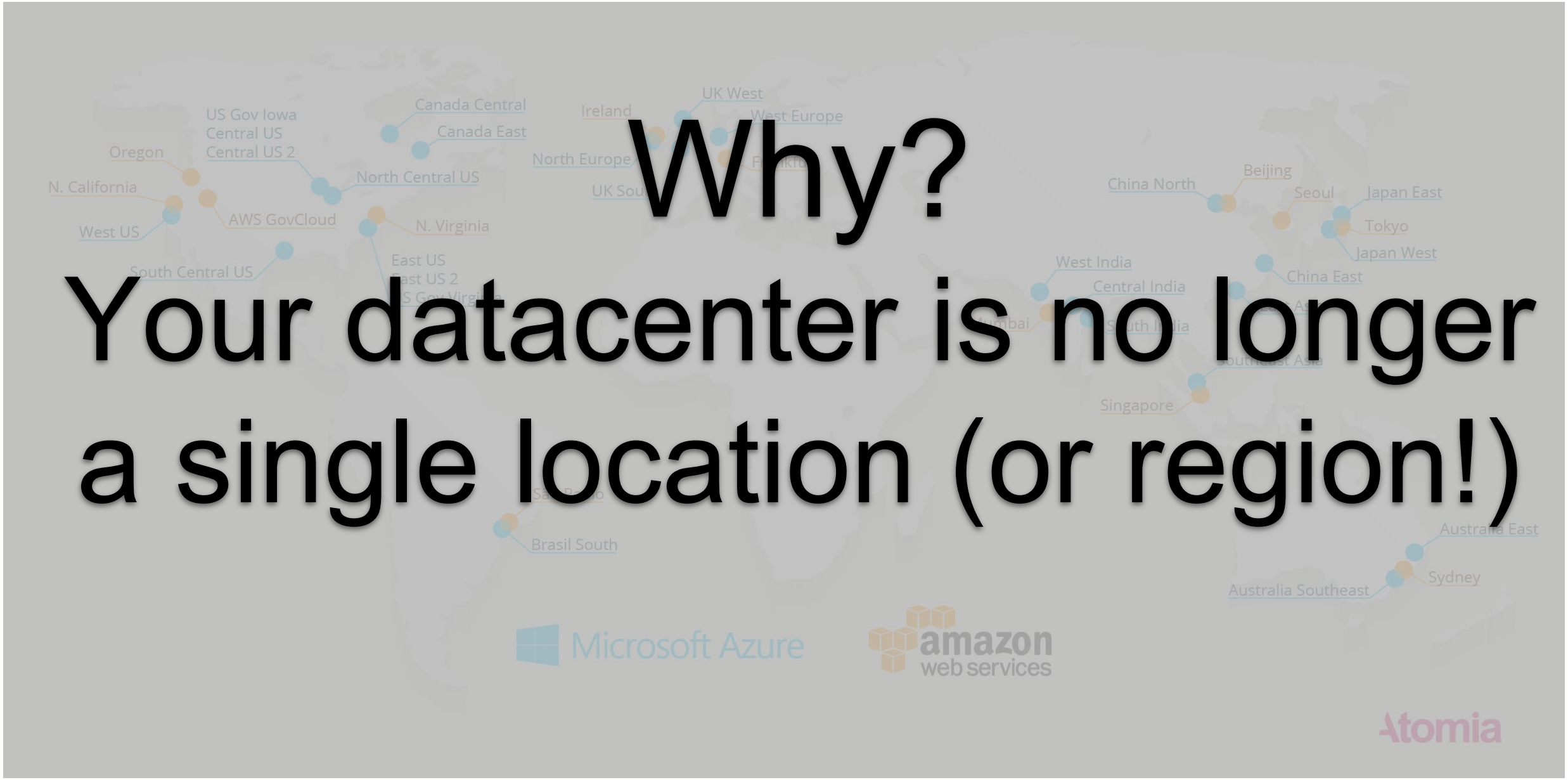
Good code matters

(and bad code can’t be hidden as easily by low latency and extra horsepower)



Redundancy matters




Why?
Your datacenter is no longer a single location (or region!)
Canada Central
Canada East
US Gov Iowa
Central US
Central US 2
Oregon
N. California
North Central US
AWS GovCloud
West US
N. Virginia
South Central US
East US
East US 2
Ireland
UK West
West Europe
North Europe
China North
Beijing
Seoul
Japan East
Tokyo
Japan West
China East
West India
Central India
Singapore
Brasil South
Australia East
Sydney
Australia Southeast
Microsoft Azure
amazon
web services
Atomia

Enabling Multi-cloud matters

AND

Bandwidth
matters...in
specific ways

Change management matters

Changing habits matters

The cloud future

The old datacenter: What remains onsite?

The new datacenter is: Sometimes on, often off, always scalable?

And then you have to deal with some things that don't handle this well at all

Questions and discussion

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Break

https://vimeo.com/336016447/bb2748ca04

The Current and Future of eSports

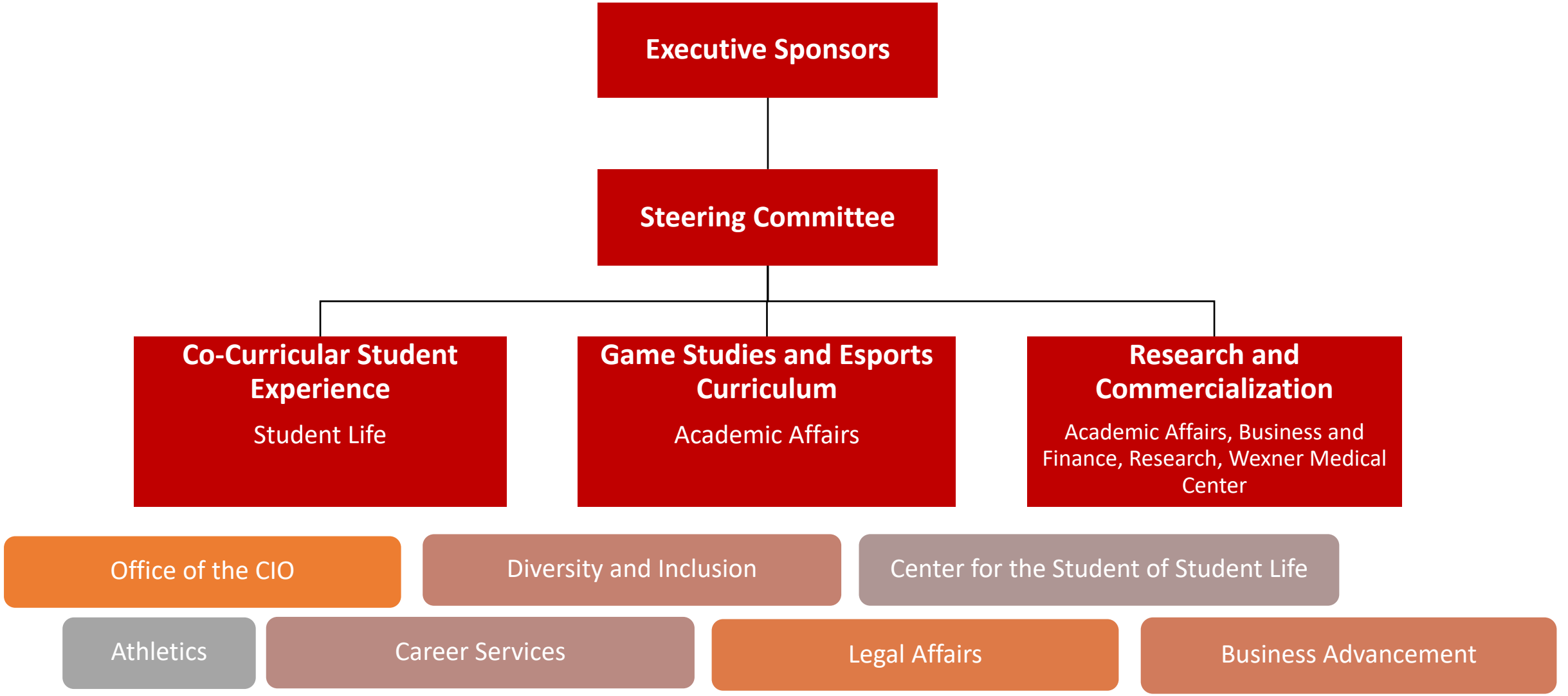
Brandon Smith // The Ohio State University
Michael Fay // University of Akron
David Smith // University of Mount Union

OH·TECH

Esports: Student Experience

THE OHIO STATE UNIVERSITY
OFFICE OF STUDENT LIFE

Program Structure



Student Experience

- **Esports Arena** - August
- Live **production studio** for gamecasts and other video
- Intramural and **intercollegiate teams**
- **Collaboration** with Human Performance Collaborative and Academic Affairs, including the Office of Diversity and Inclusion

VIVEPORT
VIVEPORT
twitch
twitch
LEAGUE OF LEGENDS
OVERWATCH

XBOX ONE
PS4

Zips Esports

Competitive Gaming at The University of Akron

Esports

Competitive Gaming

- The use of electronic systems to test one's reflexes, accuracy, strategy, communication, endurance, and mental toughness against a live human opponent.

Our Mission

Contributing to a Campus Culture of Mastery

We believe that students learn best when educated through the lens of their **passion** and our mission is to provide experiential learning opportunities so that students might develop critical **academic**, **social**, and **psychological** skills through the flourishing pastime of competitive video gaming.

Competitive Gaming at The University of Akron March 22nd 2019

Organizational Structure

ZEN

Student Led Mock Esports Startup

ZEN
ZIPSESPORTS
NETWORK

- Events
- Broadcasting
- Content Creation
- Promotions
- Application Development

ZIPS ESPORTS
AKRON ESPORTS

Varsity Esports Teams

Club Esports

Student Led RSOs – Open to All

Zips Gaming

PCs & Consoles Free for Students in Good Academic Standing

Intramural Events & Viewing Parties

Competitive Gaming at The University of Akron March 22nd 2019

January 2018

- Akron Esports Arena (*Varsity*)
  - Located in Infocision Stadium
  - 22 PCs for varsity practice/competition
  - 9 ft wide hyper wall display
  - Seating for 50
  - Broadcast Studio
- Zips Esports Center (*Hybrid*)
  - Located in the Student Union
  - 22 PCs for varsity practice/competition
  - 24 PCs for club practice/competition & recreational gaming
  - 10 console stations
  - Viewing lounge /w 86'' HD TV
- Zips Gaming Center (*Recreational Only*)
  - Located in the Williams Honors College
  - 24 PCs for recreational gaming
  - 5 console stations

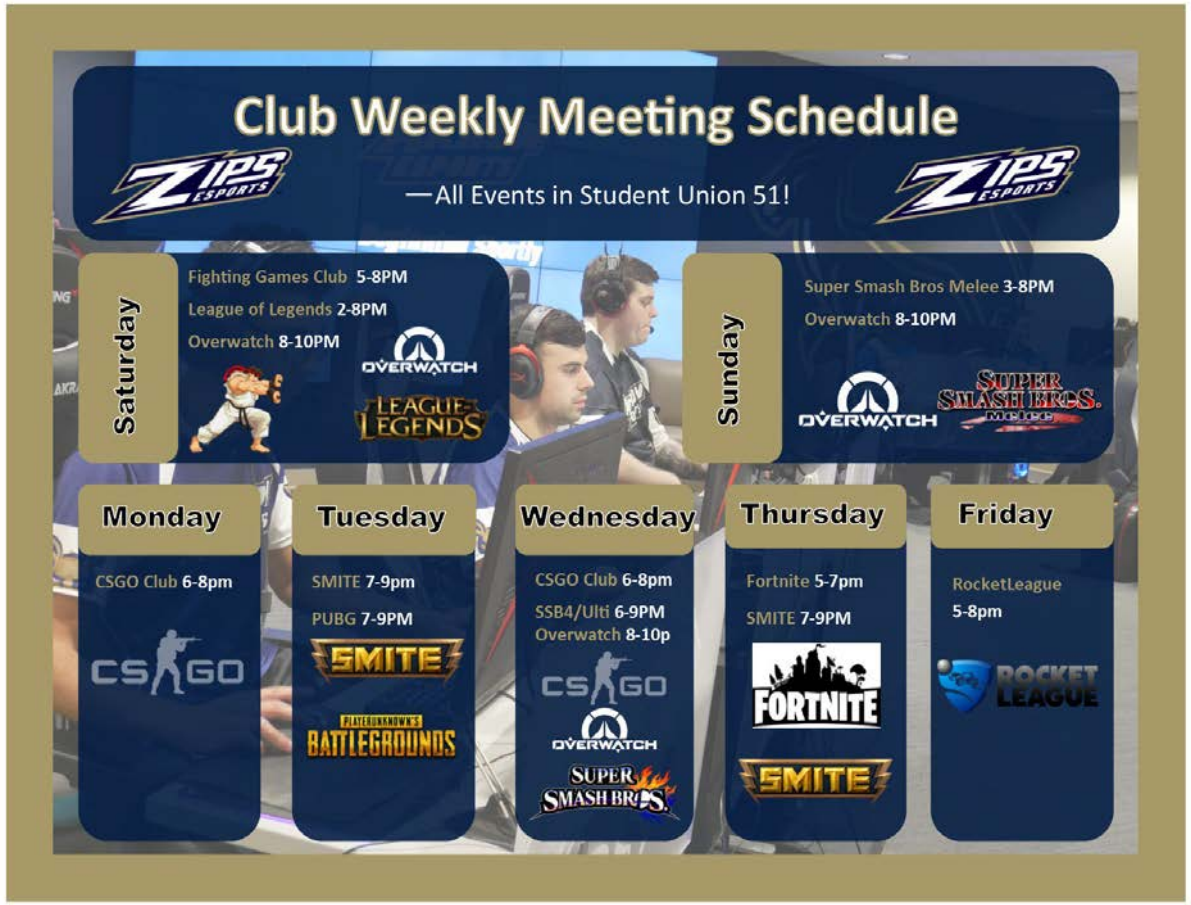
Competitive Gaming at The University of Akron March 22nd 2019

Varsity Esports

- 44 players on 5 Teams
  - League of Legends (10 players, 5 to a squad)
  - CSGO (10 players, 5 to a squad)
  - Overwatch (12 players, 6 to a squad)
  - Rocket League (6 players, 3 to a squad)
  - Hearthstone (6 players, 3 to a squad)
- Scholarships
  - +$1,000 scholarships for student-players
  - $2,500 scholarships for student-managers
  - $5,000 scholarships for student-coaches
- 10-15 hour time commitment
  - 9 hours of practices, scrimmages, & VOD review
  - 1 competition per week
  - 1 hour of yoga
  - 2 hours of strength & conditioning training
- 2.5 Minimum GPA
- Enrolled in UA Collegiate Success Program
  - Mandatory study tables for freshman & transfer students
  - Regular meetings with a tutor-mentor
  - Progress reports from professors

Competitive Gaming at The University of Akron March 22nd 2019

Club Esports



- Over 700 students involved in 14 newly formed RSOs
- Provides facilities, equipment, & organization for a much wider variety of games.
- Allows all skill levels & clubs for casual play.
- Serves as a training ground for aspiring varsity players
- Incubator for future potential varsity games
- Helps connect students of similar interests
- Many students serve in leadership roles on campus for the very first time.
- Each Club required to host one event that is open to the public in order to reserve facilities for club use.

Competitive Gaming at The University of Akron March 22nd 2019

Zips Gaming

- Creating a physical space to develop an on-campus, in-person gaming community.
  - Encouraging students to contribute to the social capital of the campus community.
- Help students develop healthy habits around gaming, timing management, & academics.
- Eliminate financial barriers to participation for low-income students
- Students get 90 free hours in the gaming facilities
- Allows for monitoring and implementation of intervention protocols for overuse
  - Staff Check-In
  - Obtain Academic Progress Report
  - Consult with Counseling Service

Zips Esports Network

Young people with passion have been the driving force behind making Esports mainstream for the past 3 decades.

- Student assistantships and internships available for students in a variety of essential esports industry roles.
  - Creative Director
  - Community Manager
  - Executive Producer
  - Technical Director
  - Graphic Designer
  - Motion Graphics Artist
  - Commentator
  - Video Editor
  - Photographer
  - Application Developer
- Creating a modern cross-disciplinary team of agile specialists to provide valuable experiential learning opportunities in an entrepreneurial context for students to:
  - Promote, plan, execute, & broadcast all varsity competitions & club events.
  - Program digital solutions for program and club pain points.
  - Propose sponsorships and participate in business development.
  - Create video and graphic content to highlight student successes.

Competitive Gaming at The University of Akron March 22nd 2019

Partnerships

Academic

- There is much to learn about esports and much that the future workforce of the esports industry could be educated on in order to get ahead of the competition.
- This includes all the fields that relate to sports and more such as
  - Psychology, Medicine, Health & Wellness, Business, Marketing, Coaching, Communication, Broadcasting, Graphic Design, Game Design, Event Production, & much more
- Efforts to provide these research and instructional opportunities to UA students within the first year include:
  - School of Communication puts first Esports Broadcasting course on the books
  - Counseling Psychology Doctoral Students Conduct practicum research with varsity players
  - Sports Science & Wellness Education Faculty conduct research on physical activity as it relates to the mental toughness of esports athletes

Sponsorship

- Males & females between the ages of 18-25 report spending the same average time watching esports content as conventional sports content. (Limelight Networks, 2017)
- As collegiate esports garner increased viewership there are a variety of endemic and non-endemic businesses that are interested in contributing funds or equipment in exchange for visibility among this demographic.
- Efforts to obtain equipment and financial contributions for the Zips Esports program in the first year include:
  - Audiotechnica, SteelSeries, Gravity Gaming, Archon Clothing, & the Cleveland Clinic.
  - Total contributions valued at over $100,000.

UNIVERSITY of
MOUNT
UNION
Be Exceptional

Location Location Location…

- Facility is a repurposed building that UMU acquired two years ago
  - 2500 approx. sq ft for esports
  - Renovated spring 2019 (almost 100% complete)
  - Includes two staff offices and “coaching room”

- Connection
  - 1G connection to campus network including campus WiFi
  - Coming soon:
    - 10G direct connection to OARnet via Spectrum with 1G of commodity bandwidth
      - This circuit will also be utilized for a backup of the campus primary circuit

Club/Student Engagement Area

Varsity Stage

Console Gaming Area

Etching

Equipment:

- 20 varsity machines
  - 12 for matches, 6 located in coaching room, 2 spares
- TBD club/student engagement (initial talks indicate 10)
  - Remaining locations are wired for students to bring laptops
- Equipment procured from iBUYPOWER, BenQ, and CDW
- Nintendo, Microsoft, and Sony will be represented in the console gaming area.

Forecast, aka we hope this happens…

- Grow esports to 20-30 students by 2020
- Realize ROI in 3-4 years
- Evolve/Relocate facility
- Add an additional esports staff member in year 2
- Sponsorships