Cloud-y with a Chance of Infrastructure

OIT Behind the Scenes

Webinar Series

Setting Expectations

Lights!

- Camera & Audio

Action!

- Participatory Activities

Camera!

- Recorded Session

Cut!

- Q & A

TODAY'S AGENDA

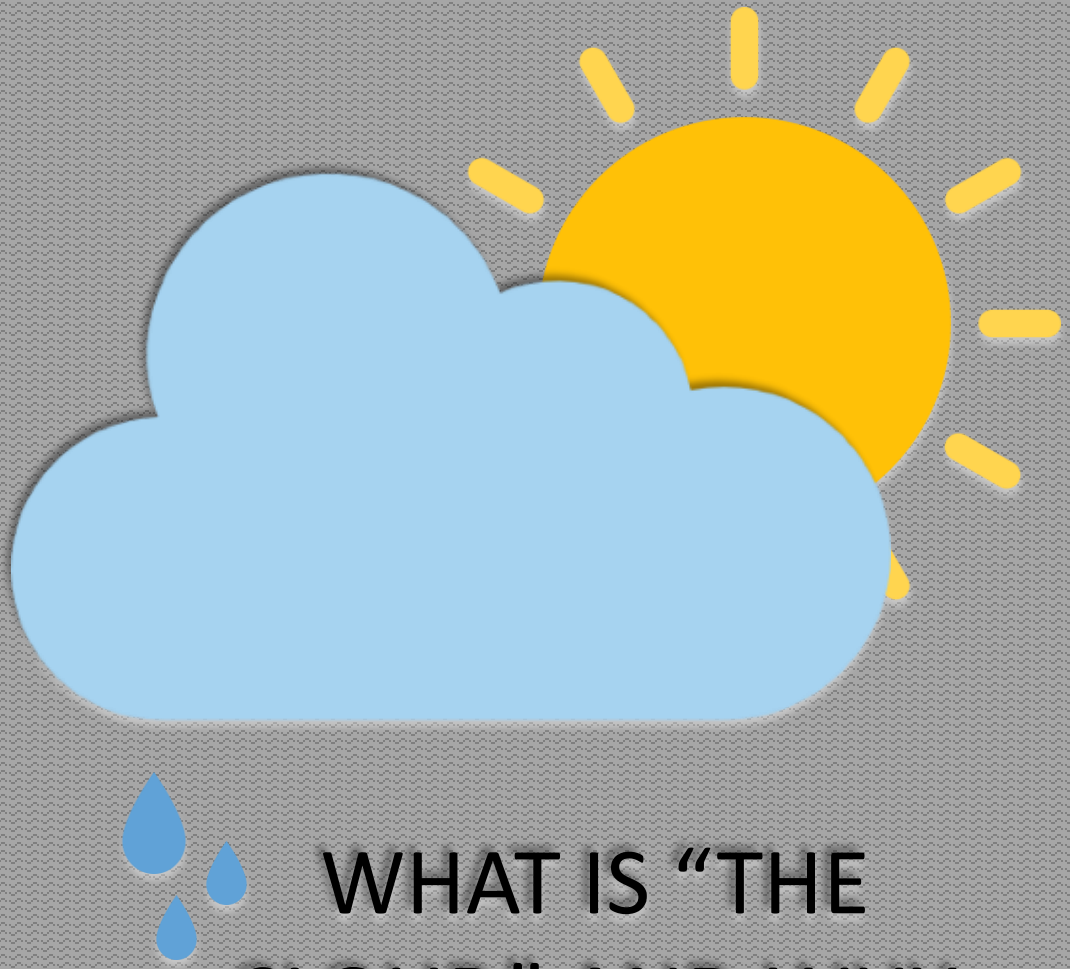
- General overview of cloud services
- Learn about cloud services at UC Merced: where we started, how it's going, and how we help bring them to campus
- How to engage with OIT to get cloud services

What Do You Think?

What is the Cloud?

JD Bingham
Endpoint Security and Automation Engineer

Storytime with JD



WHAT IS “THE CLOUD” AND WHY SHOULD I CARE?

”The Cloud” is a way for OIT to achieve

redundancy

and efficiency.

As a redundancy example, let’s take CrashPlan.

CrashPlan safeguards the user’s work and data against catastrophic events.

As a cloud-based system, CrashPlan's backups exist outside your system in case your computer or files get corrupted.

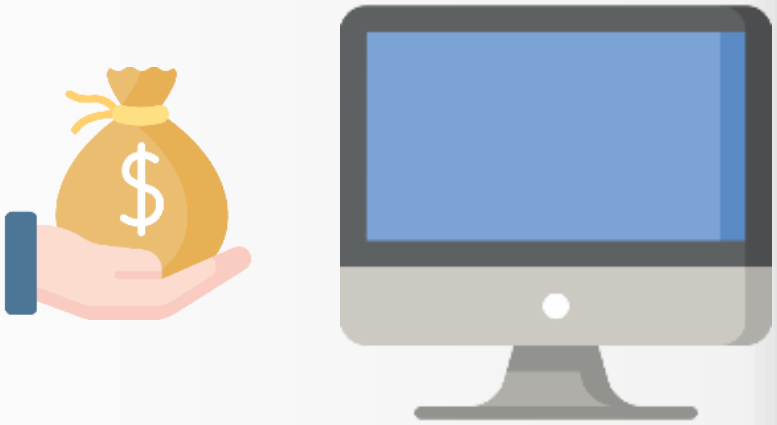
PSA: Install your CrashPlan today!

As for the cloud’s efficiency….

Let’s imagine that your team has a computer that is left on continuously in order to run a necessary digital service for the campus.

Essential Digital Service Setup Costs

Item	Cost
Computer	$1000



Though your computer is ON all the time, the application only uses 20% of the available computing resources.

You don’t necessarily need the equipment, you just need its computing power.

Removing hardware from the solution means you have fewer things that can go wrong…

…and fewer delays when they do.

Now let’s put our heads in the cloud for a moment…

Your team’s essential service needs to be:

- always available
- easily recoverable
- accessible anywhere

Instead of buying that $1,000 computer, your team sends a request to OIT to create a virtual computer for your service.

A virtual computer can run the essential service with just enough processing power and storage to get the job done.

Your virtual system has dynamic resource expandability, so you can keep up with spikes in resource demand as they happen.

And you can make mirrors of your virtual computer in different locations to prevent down time due to disasters.

Cloud computing = lower cost, more reliability, expandability, and no hardware to get in the way.

It makes for an efficient, agile IT solution.

THE END

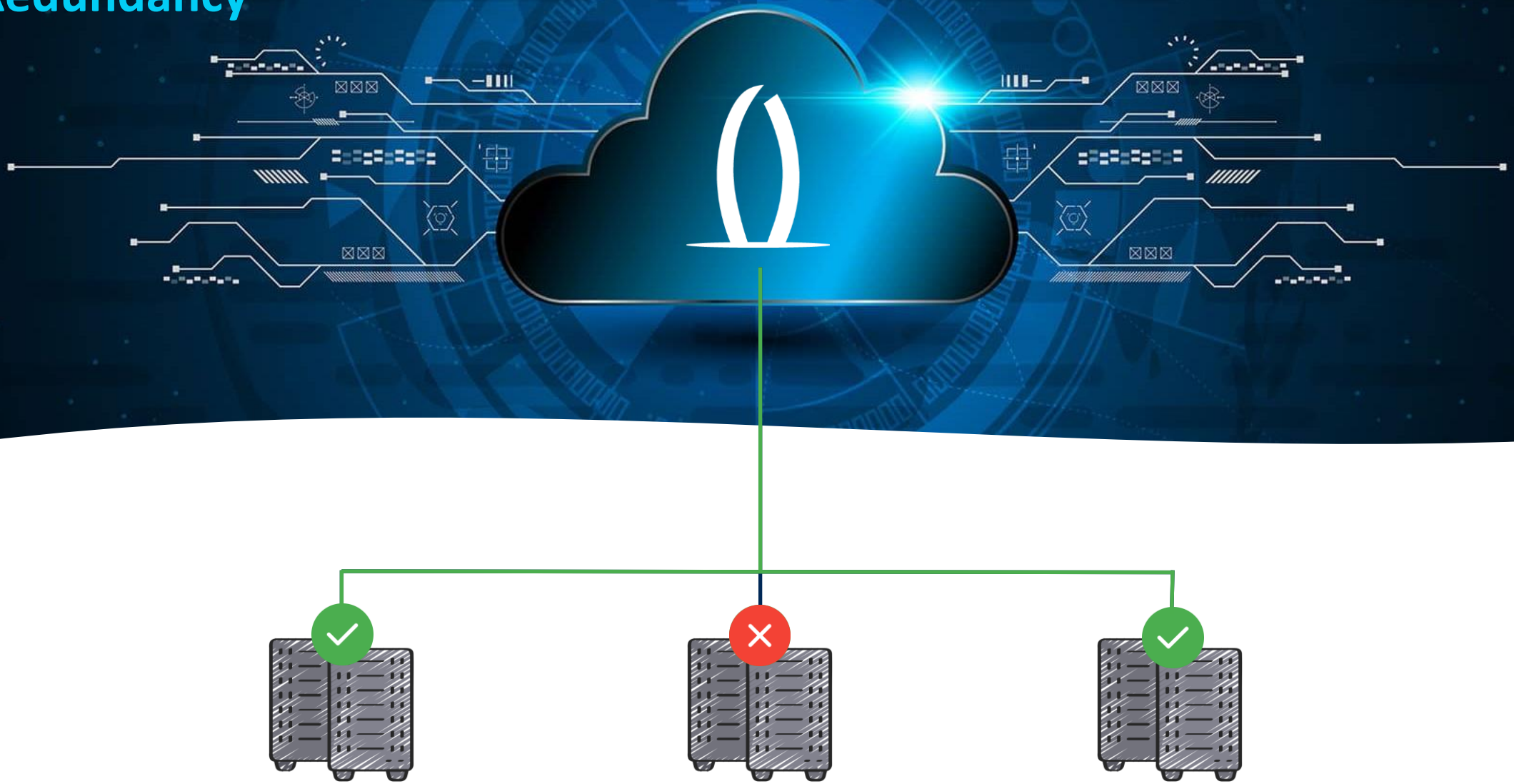
What Do You Think?

Benefits of the Cloud

Chuck Aby
Operations Management

Redundancy

Redundancy



Availability

Redundancy

Availability

Redundancy

Five Nines = 99.999% ‘uptime’

Availability

Redundancy

Downtime	
90% agreement=	36 days/year or 16 hours/week
99.999% agreement=	5.25 minutes/year or 6 seconds/week

Availability

Redundancy

	Downtime
90% agreement=	36 days/year or 16 hours/week
99.9% agreement=	9 hours/year or 10 minutes/week
99.999% agreement=	5.25 minutes/year or 6 seconds/week

Availability

Redundancy

Reliability

Reliability = measurement of consistent behavior

Availability

Redundancy

Reliability

Scalability & Elasticity

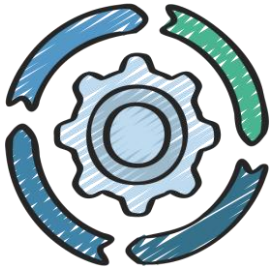
Availability

Redundancy

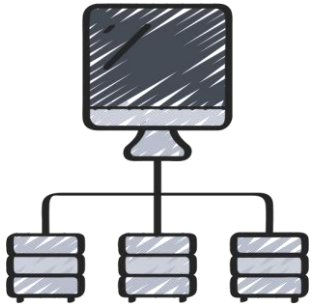
Reliability

Scalability & Elasticity

Data Storage Capacity



Processing Power



Networking

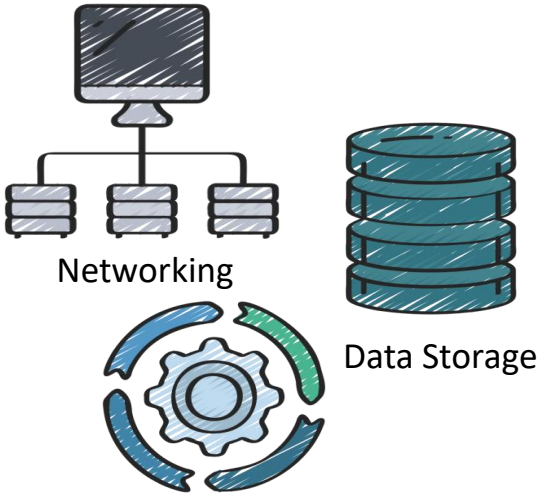
Availability

Redundancy

Reliability

Scalability & Elasticity

Scalability



Elasticity

Availability

Redundancy

Reliability

Scalability & Elasticity

Mobility

Access to applications & data

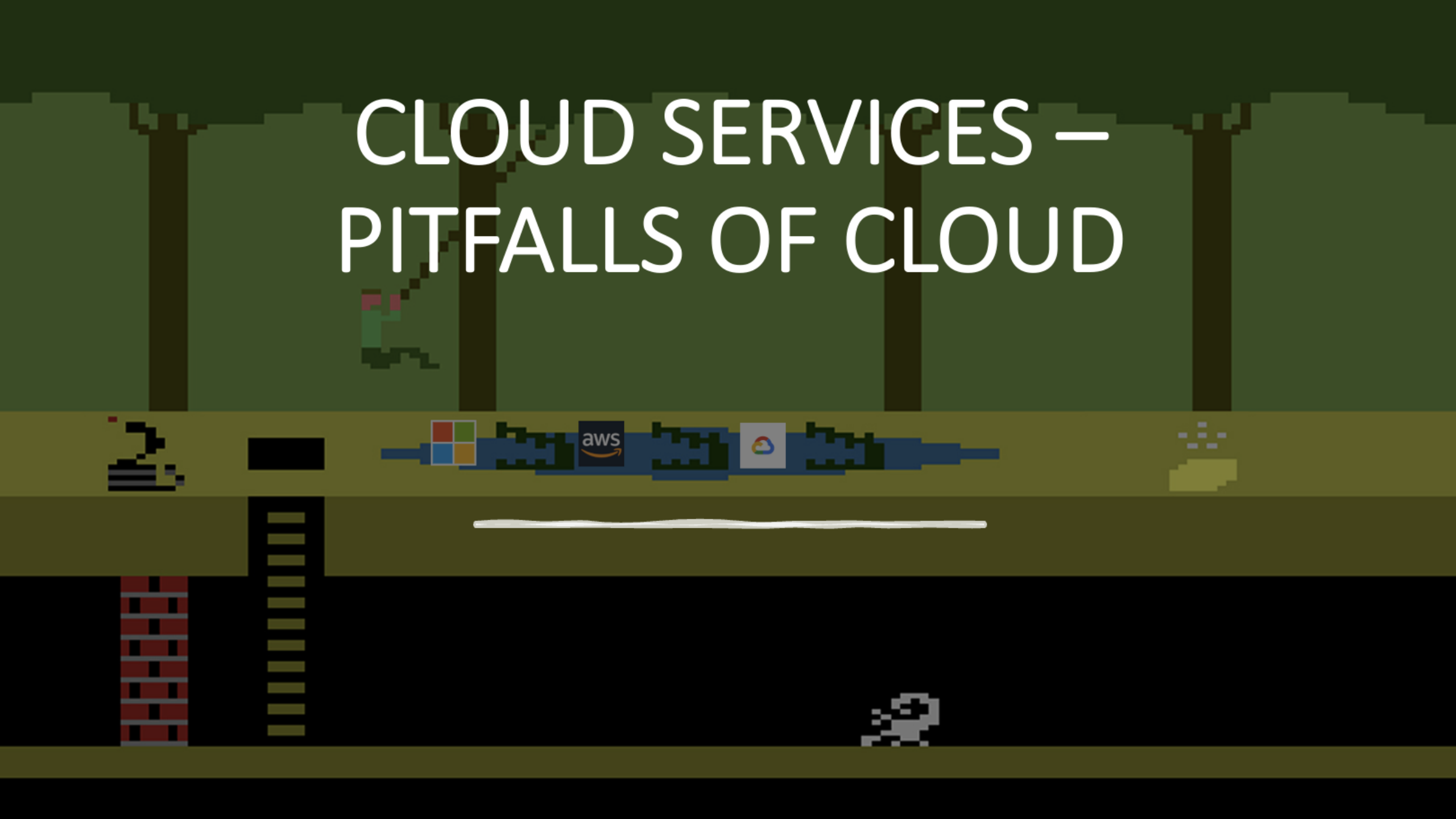

There is no cloud
it's just someone else's computer


Word
Excel
PowerPoint
Email
OneDrive
Teams
Crashplan
UC Merced Connect
Zoom
Twitter
CatCourses
TurnItIn
UNIVERSITY OF CALIFORNIA
MERCED's
cloud services
*Representation only. Not our actual server room!

Pitfalls of the Cloud

Shane Middleton
UC Merced IT Cloud Engineer

CLOUD SERVICES – PITFALLS OF CLOUD



CLOUD SERVICES, CLOUDY SECURITY

- Complexity & visibility can cause inadvertent security vulnerabilities
- Cloud security is inherently difficult

What We Do:

- Follow industry- and vendor-specific best practices
- Maintain a well-architected framework

VENDOR LOCK-IN

- Not unique to cloud services

What We Do:

- Evaluate potential cloud services carefully
- Ensure data mobility
- Keep important data backed up in multiple locations

OUTAGES HAPPEN

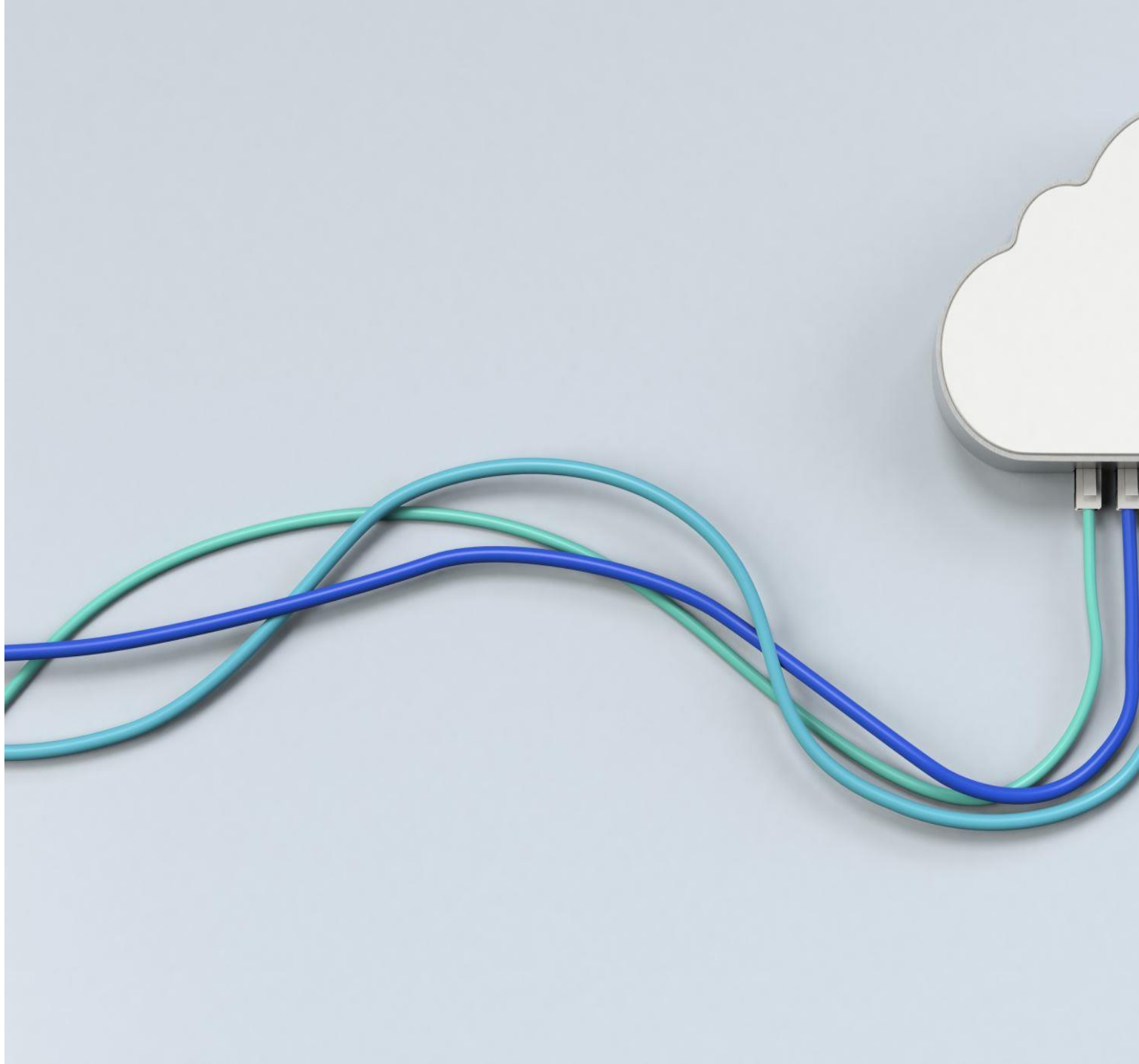
What We Do:

- Stay up to date on the specifics of the outage
- Only worry about what we can control
- Align cloud architecture with our cloud service needs

INTERNET NOT INCLUDED?

What We Do:

- Consider hosting important data locally
- Develop backup plans for accessing cloud applications and resources
- Plan accordingly



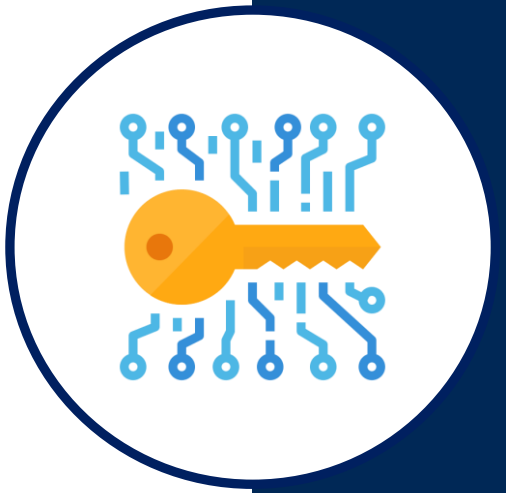
Current Efforts

Cloud Services Efforts

- Windows patching
- **Bitlocker encryption**
- Windows server upgrades
- Linux administration
- Network configuration

Windows Encryption Effort

Spring 2022 goal: Encrypt all campus-managed Windows desktops & laptops with BitLocker



- Develop code for deployments
- Testing & verification cycles
- Communications plan
- Pilot
- Review & adjust
- Finalize schedule
- Deploy

Windows Encryption Effort

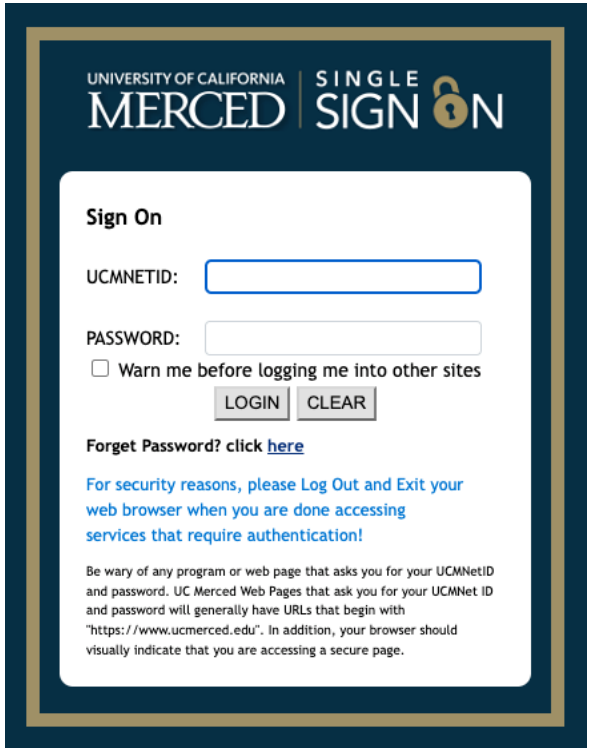
box

2014: UCMSTOR crash
- Emergency migration of data
- Unlimited capacity for educational customers

2019: Box announces storage caps & additional charges for educational customers

2021: Box announces semi-retraction of 2019 plans

Box: Configuration & Integration



- Configured for access via UC Merced email address
- Integrated with UC Merced Single Sign On

Box: Administration

Capacity

- Users – nearly 25,000
- Storage

  2014 – UCMSTOR: 27 terrabytes
  2022 – Box: 491 terrabytes
  Estimated 1% growth each month

250k photos

250 movies

6.5 mil documents

Box: New Processes

- Address maturing growth
- Avoid escalating costs

- Who is licensed?
- What happens to files?
- Use group/department Box folders

Box: Other Data Storage

- **Alternative Paid Options**
  - CatDrive
  - AWS FSX
  - AWS S3

- **Free to UC Merced users**
  - Microsoft One Drive
    - 5 terabyte cap
    - 250 gigabyte file limit

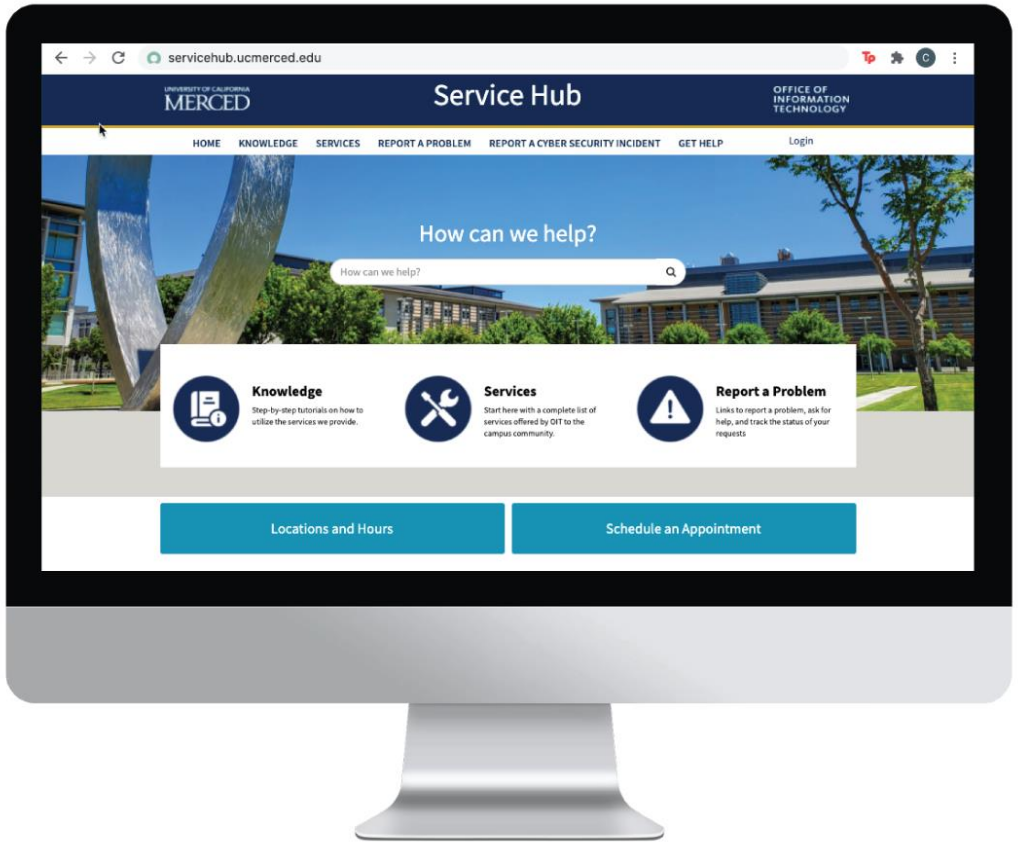
What Do You Think?

Requesting Services

- Need help? Visit:

  https://servicehub.ucmerced.edu

  Search for:
  - Amazon Web Services
  - Box
  - Crashplan
  - Storage (CatDrive)

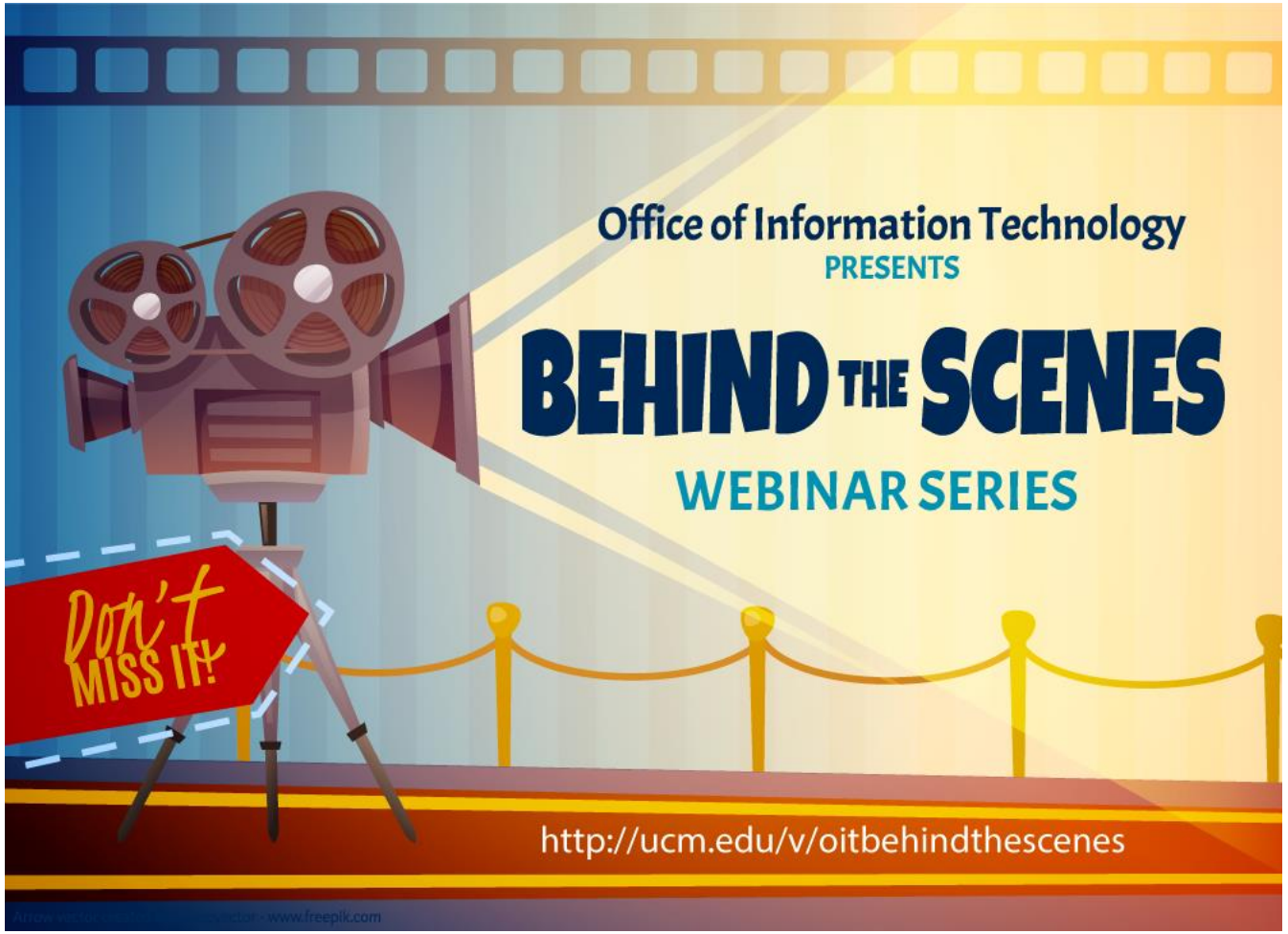



Q&A

COMING SOON

Mar 14 – Research IT

Apr 14 – Technology Procurement



http://ucm.edu/v/oitbehindthescenes

OIT Behind the Scenes: Cloudy with a Chance of Infrastructure was created on location at the University of California, Merced in Merced, California!

Thanks to all the OIT folks
who put hard work into this webinar!

Chuck Aby, Subject Matter Expert
created such detailed notes that it was easy to manage his absence
Feel better, Chuck!

Katie Adams Arca, Webinar Coordinator
tries to rein in the madness

JD Bingham, Subject Matter Expert
his ipad sketch slide background series is epic

Edson Gonzales, Webinar Support
we make him do a lot of stuff at the last minute

Nick Hansard, Webinar Support
has the most iconic profile picture of all time

That's all, folks!