2019-2020 Information Technology Committee

AGENDA

Meeting Date: Monday, April 27, 2020

Meeting Time: 2:00 – 3:00 pm.

Meeting Location: Zoom Meeting

- **Call to Order**
- **Roll Call**
- **Approval of Minutes of** *April 13, 2020*.
- **Announcements and Recognition of Guests**
  - Invited Guests: Debopam Chakrabarti; Shafaq Chaudhry; Ozlem Garibay; Eduardo Mucciolo
- **Old Business**
  - Support for research computing (cloud CPU services, cloud document services, continuity of research computing over funding gaps, STOKES financial model, research group system support).
- **New Business**
  - None
- **Other Business**
  - Upcoming meetings:
    - None
- **Adjournment**

UCF Faculty Senate
Information Technology Committee

Minutes of **April 13, 2020**
Via Skype and Conference Line

Melanie Guldi, chair, called the meeting to order at 2:00 pm. The roll was called orally.

In Attendance: Thad Anderson, Lee Dotson, James Gallo, Sandra Galura, Steffen Guenzel, Melanie Guldi (Senate Liaison), Joseph Harrington (Steering Liaison), Athena Hoeppner, Pieter Kik, Viatchelslav Kokoouline, Robert Macy, Heath Martin, Matthew Nobles, JP Peters (ex officio), and Francisca Yonekura (ex officio).

Minutes: Motion and second made to approve the minutes of the *March 16, 2020* meeting. Motion and second made to approve the minutes of the *March 30, 2020* meeting. In both cases, motions passed.

Chair Announcements:

- The chair announced that invited Chris Vakhordjian from Information Security Office provided some information today's meeting and the March 30th meeting regarding the security issues related to Zoom. The following replicates text from his email:

  Zoom is safe to use, especially for instructional purposes and that was the general intent for this tool. Of all the media hype there are a couple of things that concern me, and that is Zoom's position on encryption and the incident regarding Zoom traffic being routed through China to address network congestion. Some of the other reported issues have been addressed or are having to do with user settings when meetings were scheduled.

  From the application administration point of view, the following are set:
  - *Participant Video is Off by default*
  - *Join before Host is Off by default*
  - *Require a Password when Scheduling New Meetings is On by default*
  - *Screen Sharing is set to "Host Only" by default (set by Zoom)*
  - *Waiting Room is On by default for Participants*

  These settings will mitigate most everything we hear on the news.

  I would suggest promoting Zoom for basic instructional purposes. There are other technologies one can use if there is continued concern, such as Skype and Teams. This does not necessarily mean that these are more secure (they just haven't received the same level of attention and scrutiny), especially if we can't control what tool is used on each end of the call. For example, on one side of a call one uses Skype, and on the other side one is using MagicJack. Is that secure? ☺Perhaps Zoom to Zoom calls, or Teams to Teams calls, are more secure. It gets complicated

- The committee had several follow up questions on Zoom security. 1. Does Zoom security meet with FERPA guidelines? (JP indicated he would follow up with Chris from ISO). 2. Specifically, is it ok to discuss grades via Zoom? (JP provided a link to Zoom's Ferpa guide: https://zoom.us/docs/doc/FERPA%20Guide.pdf , which includes the level of encryption Zoom uses).

- Next, the chair announced that Michael Sink had provided a report on the length of time IT service requests were taking. JP Peters went over the report (the figures from the report are contained at the end of the minutes) with the committee and the committee asked several questions.
    - During the presentation, JP indicated that they had implemented a new coding of service requests approximately two weeks ago (so approximately 4/1/20) to better identify when a ticket would be expected to take less than 5 days, but actually take much longer.
    - The committee asked whether this could be broken down by requests from faculty vs IT (vs students); and whether we can break down by exact task; and whether we can track time based on who the task is sitting with (like when submitting to a journal)
    - The committee asked how one can reopen a closed ticket. JP indicated that a ticket cannot be reopened after it's closed (tickets are closed automatically after 3 business days). But a new ticket can reference the old ticket number. The committee noted that this might make the "request reopen count" incorrect.

- **Old Business**
    - Continue Discussion of Issues related to Online Learning/ Remote Working due to the COVID-19 lockdown
        - The committee asked whether there were people on campus that could address things like rebooting a computer while the campus is working remotely. (JP indicated there are people assigned to address such on-campus requests).
        - The committee asked whether there is an alternative to the Lockdown Browser available in Webcourses. The Lockdown Browser does not work when using Linux operating system, and per faculty students have increasingly indicated they are working in Linux environment. Francisca suggested several possibilities including HonorLock (going through contract) and Proctorhub (already available in Webcourses).
    - Regarding: Support for research computing (cloud CPU services, cloud document services, continuity of research computing over funding gaps, STOKES financial model, research group system support).
        - The committee suggested inviting key stakeholders to our next (and final) meeting of the year.

- **New Business**
    - None

Other Business
- None

ADJOURNMENT

The meeting adjourned at 2:53 pm.

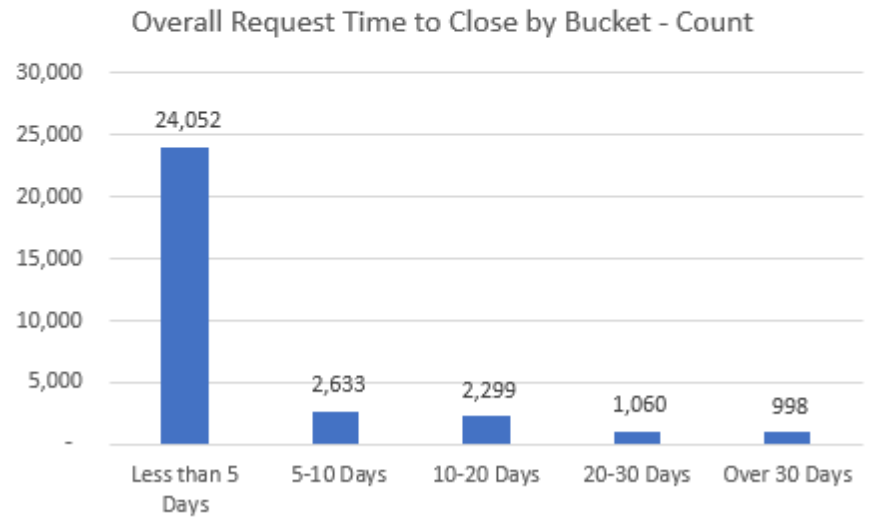
Report prepared by Michael Sink and Delivered to Committee by JP Peters during the 4/13/20 meeting

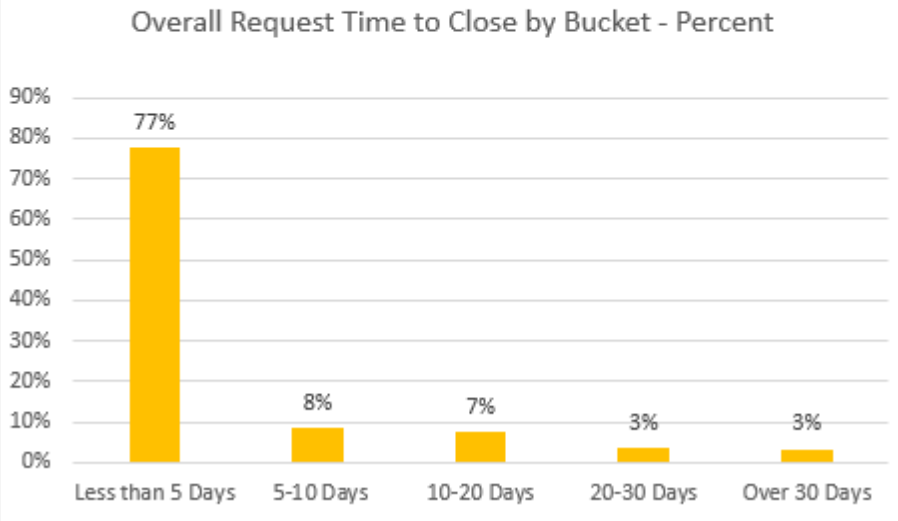
Below are some dashboard reports we created that we use on a regular (at least daily – I also look at these every morning) basis to track service levels. JP is going to join the call this afternoon as well and prepare to speak to the reports. I will try to be there, but we are having some medical issues in our household today that may result in a visit to the hospital – non-COVID, but the last thing we want is to go to the hospital right now.

Service Level Targets can be found here: https://it.ucf.edu/our-services/service-categories/#slt

12 Month Service Request Statistics

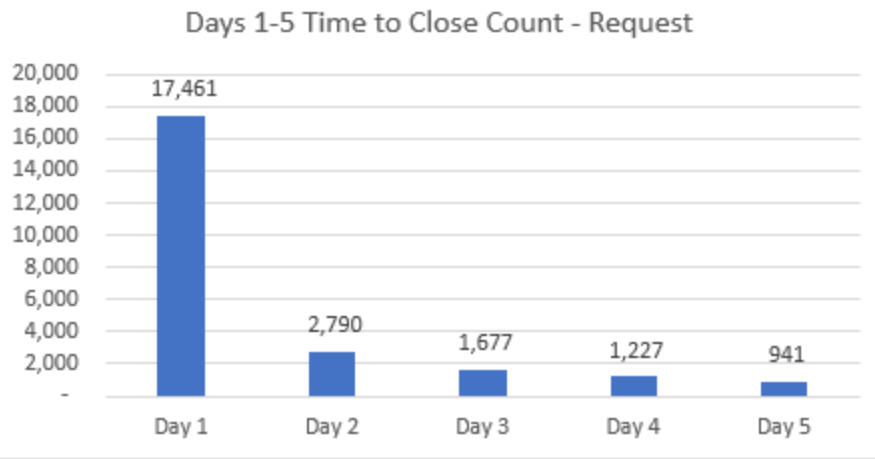
Less than 5 Days	5-10 Days	10-20 Days	20-30 Days	Over 30 Days	Totals
24,052	2,633	2,299	1,060	998	31,042
77%	8%	7%	3%	3%	100%

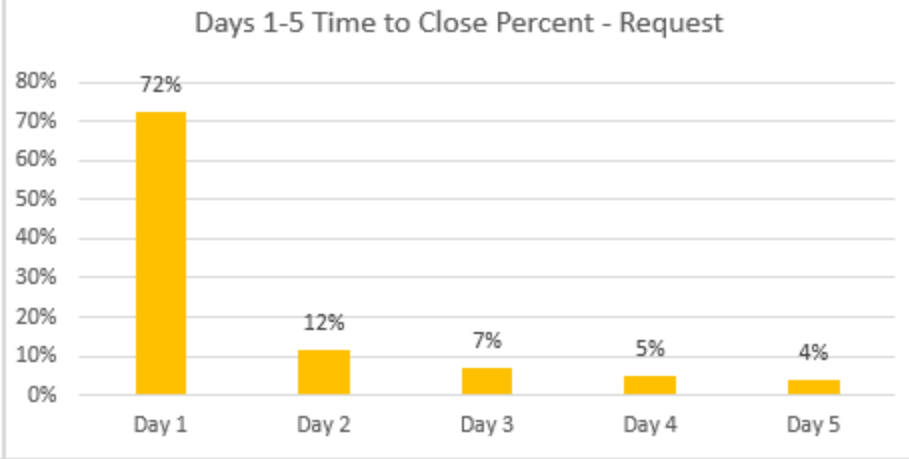




Days 1 - 5 Service Request Statistics

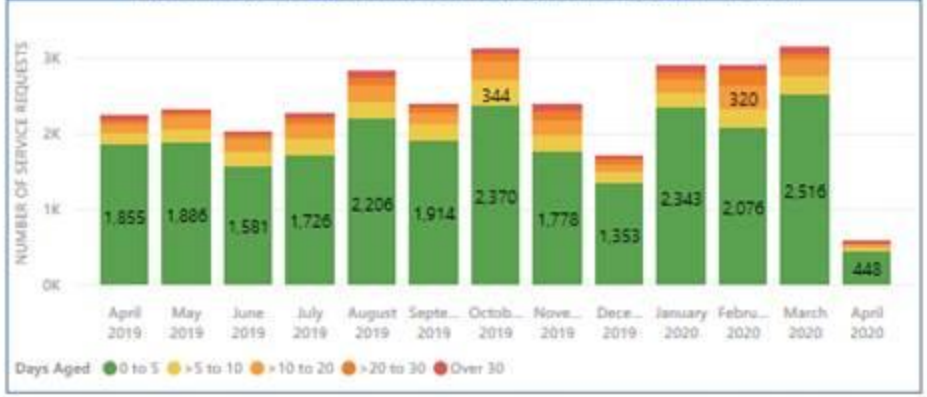
Day 1	Day 2	Day 3	Day 4	Day 5	Totals
17,461	2,790	1,677	1,227	941	**24,096**
72%	12%	7%	5%	4%	**100%**





MONTH OVER MONTH SERVICE REQUESTS TIME TO FULFILLMENT - UCF IT

MONTH OVER MONTH SERVICE REQUESTS COUNT - UCF IT



≤ 5 DAYS AGED	> 5 TO 10 DAYS AGED	> 10 TO 20 DAYS AGED	> 20 TO 30 DAYS AGED	OVER 30 DAYS AGED	TOTAL COUNT
24,052	2,633	2,299	1,060	998	31,042

TOP 15 SERVICE REQUESTS (AVG. DAYS) - UCF IT

SERVICE REQUESTS TASKS (AVG. DAYS) - UCF IT

Approved by UCF IT Business Intelligence Committee

Updated on: Apr 08, 2020 10:08:20 AM

2,413
OPENED MONTHLY AVERAGE

31,372
OPENED SERVICE REQUESTS

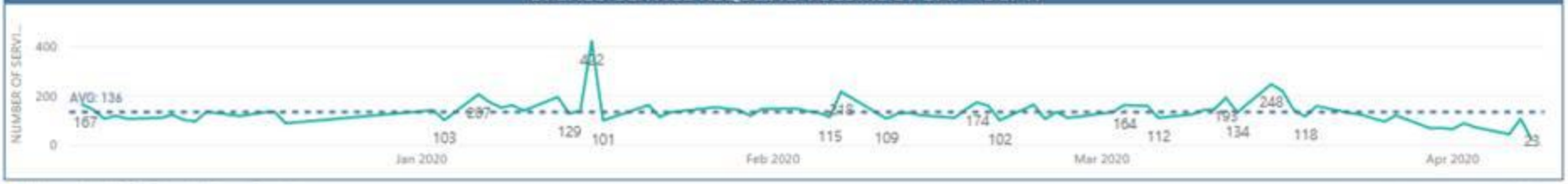
2,389
CLOSED MONTHLY AVERAGE

31,062
CLOSED SERVICE REQUESTS

OPENED VS CLOSED SERVICE REQUEST VOLUME BY MONTH - UCF IT

MONTH OVER MONTH SERVICE REQUEST REOPEN COUNT - UCF IT

OPENED SERVICE REQUESTS VOLUME BY DAY - UCF IT



Approved by UCF IT Business Intelligence Committee

Updated on: Apr 08, 2020 10:08:20 AM

Cloud Computing for Science and Research

Presented by Shafaq Chaudhry

Assistant Director, Graduate & Research IT, Office of Research, UCF

NSF Trusted Cyberinfrastructure Fellow, 2019

Shafaq.Chaudhry@ucf.edu

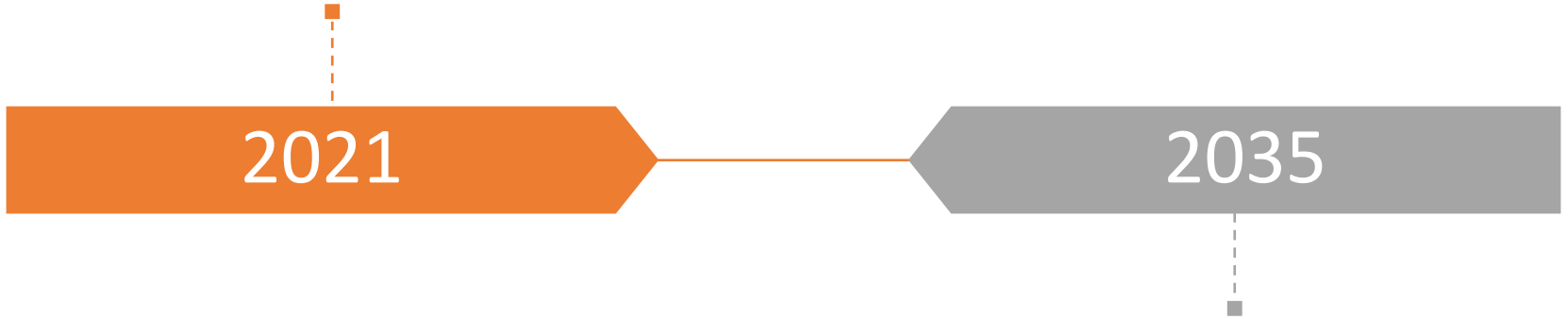
Image Credit: NSF website, *Moon Light PhotoStudio/Shutterstock.com*

Outline

- UCF Research Mission
- UCF Aspirations
  - Cloud Storage
  - Cloud Collaboration
  - Cloud Computing
- UCF Researcher Needs Assessment
- Current state of cloud computing services at UCF
- Food for Thought

UCF Research Mission Alignment

$250M research funding by 2021



Become a top 50 research university by 2035

Presenter: Shafaq Chaudhry, Office of Research

Big Ten Academic Alliance – Highly ranked Institutions

Member Institutions (In Order of Ranking per ARWU)	2017 Academic Ranking of World Universities (ARWU) - National Rank	2017 Academic Ranking of World Universities (ARWU) - World Rank	2018 USNWR National University Rankings	Geographic Region per IPEDs	Land Grant Institution	Public/Private University
Northwestern	18	22	11	Great Lakes	No	Private
Michigan	19	24	28	Great Lakes	No	Public
Wisconsin	21	28	46	Great Lakes	Yes	Public
Minnesota	24	34	69	Great Plains	Yes	Public
Illinois	26	37	52	Great Lakes	Yes	Public
Maryland	32	53	61	Mid East	Yes	Public
Purdue	38	77	56	Great Lakes	Yes	Public
Rutgers	39	79	69	Mid East	Yes	Public
Ohio State	40	80	54	Great Lakes	Yes	Public
Penn State	43	85	52	Mid East	Yes	Public
Indiana	49	Top 150	90	Great Lakes	No	Public
Michigan State	49	Top 150	81	Great Lakes	Yes	Public
Iowa	61	Top 200	78	Great Plains	No	Public
Nebraska	61	Top 200	124	Great Plains	Yes	Public

Source: BTAA.org

1/31/2018

Big Ten Academic Alliance – 2016 BTAA Data: Students, Faculty, Research Expenditures

2016 Big Ten Academic Alliance Data							
					IPEDS Fall Estimated Enrollment		
	Research Expenditures	Full-Time Faculty (Instruction, Research, & Public Service)	Full-time Faculty (Instruction Only)	Total Students (Full- and Part-Time)	Full-Time Students	Full-Time Graduates	Full-Time Undergraduates
Illinois	$625,000,000	2,342	2,248	46,951	42,453	9,767	32,540
Indiana	$529,413,414	2,600	2,086	49,695	38,398	6,393	32,005
Iowa	$436,278,375	2,614	2,359	32,011	25,624	4,756	20,868
Maryland	$484,848,450	3,371	1,803	39,083	34,444	8,094	26,350
Michigan	$1,393,105,207	6,344	6,344	44,718	42,361	14,392	27,969
Michigan State	$613,369,000	3,849	2,860	50,340	43,695	8,248	35,447
Minnesota	$939,575,000	5,250	3,445	51,579	39,302	9,736	29,566
Nebraska	$430,977,377	1,841	1,320	25,897	22,062	2,681	19,381
Northwestern	$534,542,720	3,313	2,216	21,823	17,475	9,177	8,298
Ohio State	$847,093,360	3,840	3,735	59,482	51,817	9,955	41,862
Penn State	$836,353,000	3,427	2,750	47,789	45,874	5,735	40,139
Purdue	$622,353,000	2,614	1,989	41,513	35,884	6,575	29,309
Rutgers	$630,212,000	3,920	3,165	50,146	42,749	8,729	34,020
Wisconsin	$1,108,564,000	4,447	3,381	42,582	38,284	9,707	28,577

Source: BTAA.org 1/31/2018

UCF 2019-2020: $200+ M; 1,949 faculty FTE; 69,525 students; 9553 graduate students;

Big Ten Academic Alliance vs. UCF

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	Research Expenditures	Full-Time Faculty (Instruction, Research, & Public Service)	Full-time Faculty (Instruction Only)	Total Students (Full- and Part-Time)	IPEDS Fall Estimated Enrollment Full-Time Students	Full-Time Graduates	Full-Time Undergraduates
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Source: BTAA.org 1/31/2018

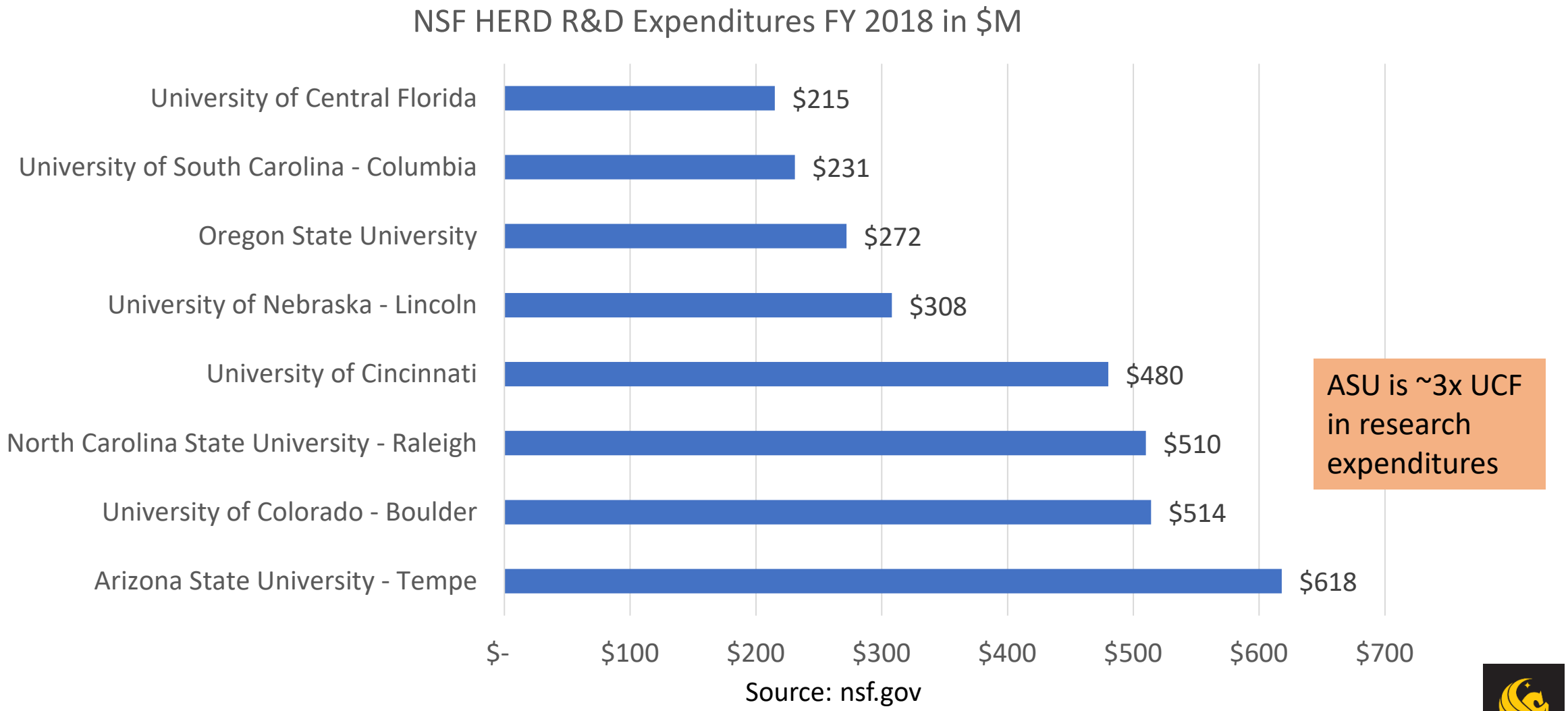
Big Ten Academic Alliance – Cloud Storage and Computing

Source: Each University's website search and Google search

	Storage				Cloud Computing				Code Repo
U of Michigan		Google Drive	Box		AWS	Azure	GCP		GitLab
Northwestern U	OneDrive	Google Drive	Box		AWS	Azure			GitHub
U of Wisconsin	OneDrive	Google Drive	Box		AWS	Azure	GCP*	IBM*	Mercurial (HEP)
UIUC	OneDrive	Google Drive	Box		AWS	Azure	GCP		GitHub
Penn State U	OneDrive	Google Drive	Box		AWS	Azure			GitHub
Ohio State U	OneDrive		Box		AWS				UCR (based on git)
Michigan State U	OneDrive	Google Drive			AWS	Azure			GitLab
Purdue U		Google Drive	Box	Dropbox					GitHub
U of Minnesota		Google Drive	Box			Azure		OpenStack	Github
Indiana U	OneDrive	Google Drive	Box		AWS	Azure	GCP		Github
U of Iowa	OneDrive			HomeDrive, SharedDrive	AWS	Azure			GitLab
U of Nebraska	OneDrive		Box		AWS				GitLab
Rutgers	OneDrive	Google Drive	Box		AWS	Azure	GCP		GitLab
U of Maryland	OneDrive	Google Drive	Box		AWS	Azure	GCP (CS)		GitLab (CS)

** Under negotiation*

UCF's Aspirational Universities' R&D Exp. FY18



ASU is ~3x UCF in research expenditures

Source: nsf.gov

Presenter: Shafaq Chaudhry, Office of Research

Cloud Storage at UCF Aspirational Institutions

Arizona State University	OneDrive	Google Drive	Dropbox
Auburn University	OneDrive		Box
North Carolina State U. Raleigh	OneDrive	Google Drive	
Oregon State University	OneDrive	Google Drive	Box
University of Cincinnati	OneDrive		Box
University of Colorado - Boulder	OneDrive	Google Drive	
University of Nebraska - Lincoln	OneDrive		Box
U. of South Carolina - Columbia	OneDrive		
U. of Central Florida	OneDrive		

Source: Each University's website search and Google search

Collaboration at UCF Aspirational Institutions

Arizona State University	Zoom	Slack	Teams	Google Meet	
Auburn University	Zoom		Teams		
North Carolina State U. Raleigh	Zoom	Slack*		Google Meet	WebEx
Oregon State University	Zoom	Slack (Engg.)	Teams	Google Meet	
University of Cincinnati			Teams		WebEx
U. of Colorado – Boulder	Zoom	Slack, Trello	Teams	Google Meet	
U. of Nebraska – Lincoln	Zoom		Teams		
U. of Central Florida	Zoom		Teams		

Source: Each University's website search and Google search

* not provided centrally, but it is not a prohibited service if not being used for sensitive data

Cloud Computing at UCF Aspirational/Peers

Arizona State University	AWS	Azure	
Auburn University	AWS*	Azure	GCP*
North Carolina State U. Raleigh	AWS	Azure	
Oregon State University	AWS	Azure	
University of Cincinnati	AWS	Azure	
University of Colorado - Boulder	AWS	Azure	GCP (CSEL)
University of Nebraska - Lincoln	AWS	Azure	GCP*
U. of South Florida	AWS	Azure	GCP
U. of Central Florida	AWS	Azure	

*Researcher using it

Source: Each University's website search and Google search

Cloud Computing for Advancing and Accelerating Research

- Cloud enables researchers to process large datasets with complex inter-relationships, high-performance and high-throughput computation needs and machine learning capabilities
- Top cloud providers in 2020 (Computing, storage and serverless functions)
  - Amazon Web Services (AWS)
  - Microsoft Azure
  - Google Cloud Platform (GCP)
- Multi-cloud strategy recommended for research for competitiveness

Increased trend supporting Cloud Computing from Funding Agencies

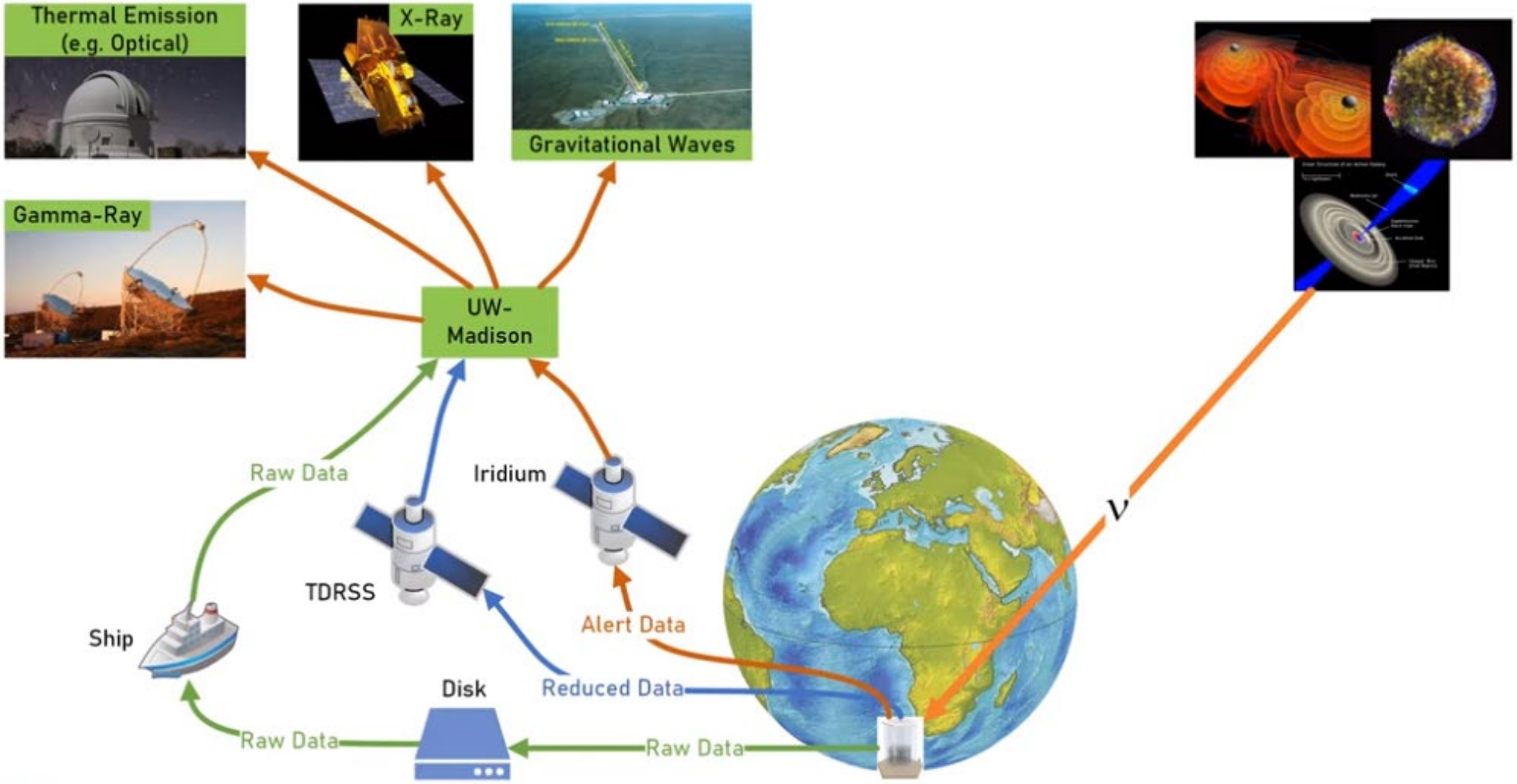
- NSF's BIGDATA Program, Feb 2018, $9 million in cloud credits
  - AWS, Azure, GCP
  - https://www.nsf.gov/news/news_summ.jsp?cntn_id=244450

Image Credit: *NSF*

Increased trend supporting Cloud Computing from Funding Agencies

- NSF-funded **Exploring Clouds for Acceleration of Science (E-CAS)**, March 2019
  - Contributions from AWS and GCP
  - https://www.internet2.edu/vision-initiatives/initiatives/exploring-clouds-acceleration-science/
- 6 projects chosen:
- Accelerating Science by Integrating Commercial Cloud Resources in the CIPRES Science Gateway, San Diego Supercomputing Center
- Investigating Heterogeneous Computing at the Large Hadron Collider, MIT
- Ice Cube computing in the cloud, University of Wisconsin
- Building Clouds: Worldwide building typology modelling from images, Purdue
- Deciphering the Brain's Neural Code Through Large-Scale Detailed Simulation of Motor Cortex Circuits, State University of New York
- Development of BioCompute Objects for Integration into Galaxy in a Cloud Computing Environment, George Washington University

Multi-Messenger Astrophysics

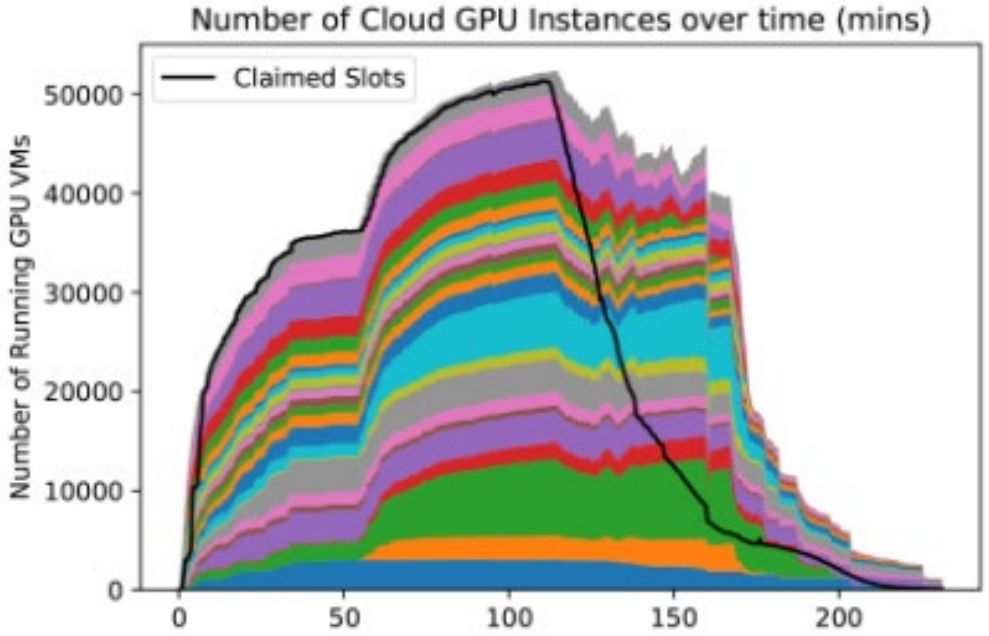


IceCube GPU Cloudburst Experiment, Nov'19

Multi-messenger astrophysics run

ExaFLOP compute pool in the cloud

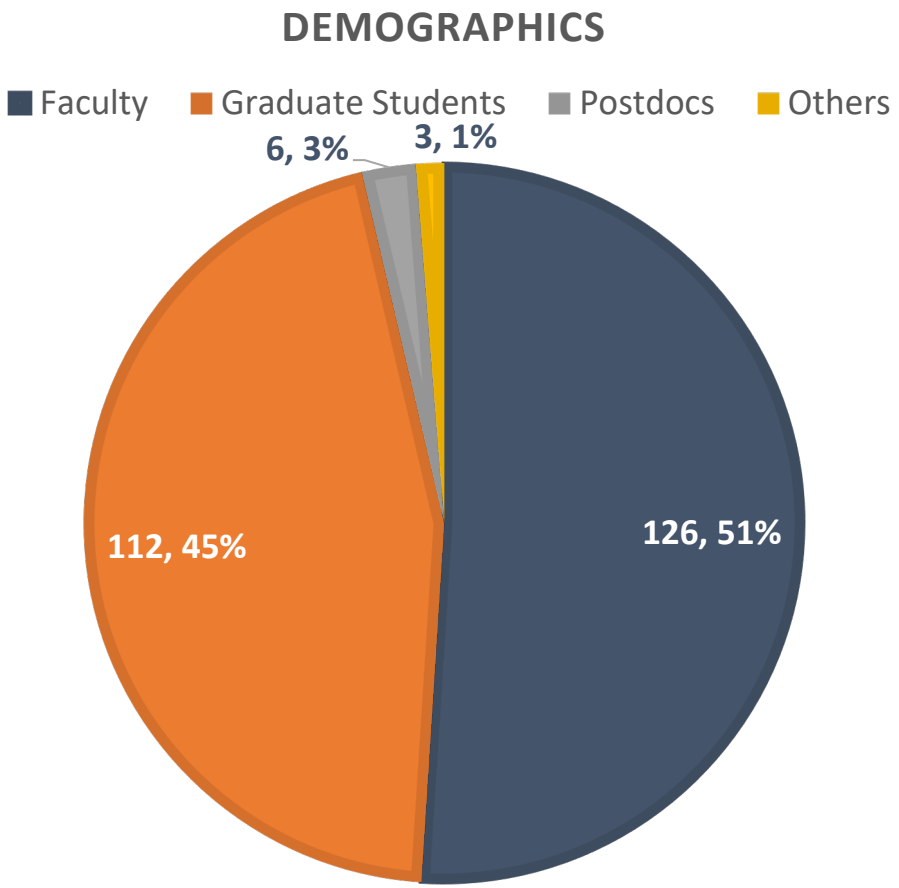
- 51,500 GPUs (AWS, Azure, GCP)
  - Largest GPU Cloud Simulation in the world
- Aggregate peak of 350 PFLOP32s
  - 90% of the performance of fastest supercomputer in the world, *Summit* at ORNL
- 2-hour experiment
- Goals:
  - Readiness for bursting into exascale computing



The chart shows the time evolution of the burst over the course of ~200 minutes. The black line is the number of GPUs used for science, peaking at 51,500 GPUs. Each color shows the number of GPUs purchased in a region of a cloud provider. The steep rise indicates the burst capability of the infrastructure to support short but intense computation for science. Credit: Igor Sfiligoi, SDSC/UC San Diego

Source: https://wipac.wisc.edu/

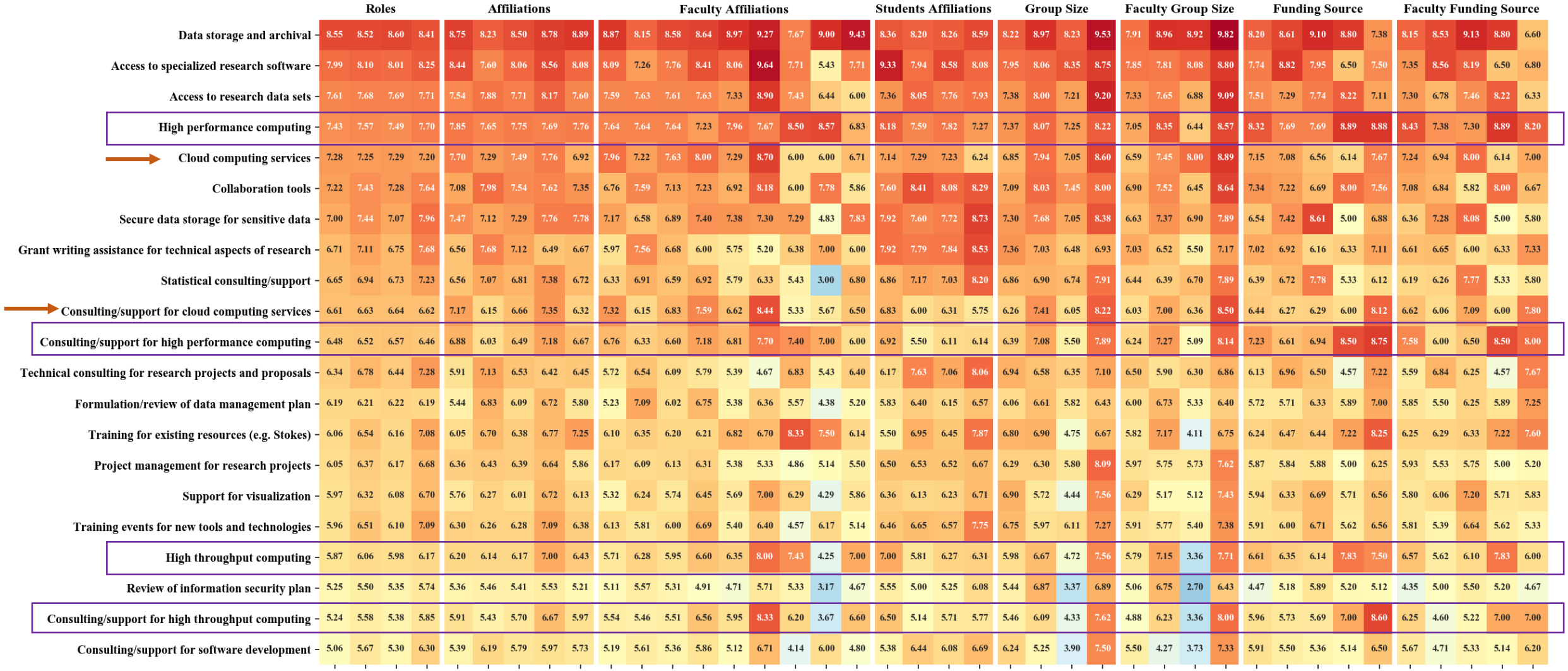
UCF Research Needs-Assessment, 2019



247 Respondents

What is Important?
How well are you supported?

Acknowledgment: *Survey work done by Dr. Fahad Khan, Research IT, Office of Research, UCF*



Importance of services

UCF Research Needs Assessment, 2019
Top 10 Important Services for Research

- Data Storage and Archival
- Access to Specialized Research Software
- Access to Research Data Sets
- High Performance Computing
- Cloud Computing
- Collaboration Tools
- Secure Data Storage
- Technical Grant Writing
- Statistical Computing
- Consulting for Cloud Computing

Microsoft Azure at UCF

- UCF has two Enterprise Agreements with Microsoft
- Contract with Arecibo: Zero storage costs
- Contract with UCF has multiple subscriptions
- Subscription for Research Use
  - Databricks project
- Subscription for General Use, Managed by UCF IT
  - Well-established subscription with security features
  - Authentication, auditing, backups, identity management
  - Full-mesh connectivity back to campus

Photo credit: *NSF/AO*

Microsoft Azure, UCF IT Services

- Free one-hour cloud consultation

Source: https://it.ucf.edu/cloud/what-we-offer/

- **Virtual Machines** – Provision Windows and Linux virtual machines
- **Storage** – Durable, highly available, and massively scalable cloud storage
- **Archive Storage –** For storing rarely accessed data
- **Azure SQL –** Managed, intelligent, and scalable cloud databases
- **Azure Backup –** Simplify data protection and protect against ransomware
- **Azure DNS** – Host your non-EDU domain in Azure
- **Data Box** – Secure, ruggedized appliance for bulk data transfer into Azure

Amazon Web Services (AWS) at UCF

Through Texas Department of Information Resources (TX-DIR) DIR-TSO-4221
https://dir.texas.gov/View-Search/Contracts-Detail.aspx?contractnumber=DIR-TSO-4221

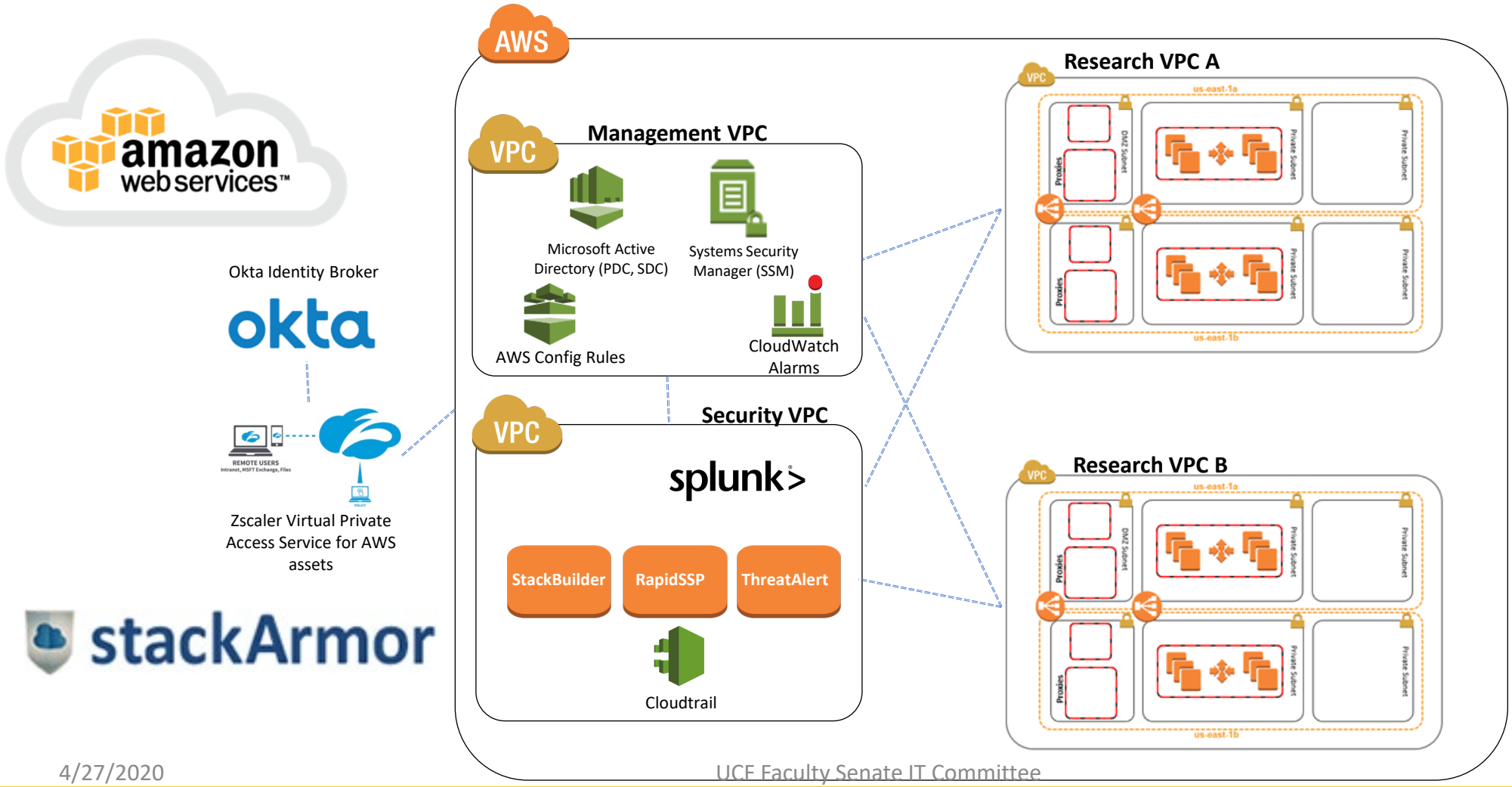
- **AWS Cloud Credits for Research**
  - https://aws.amazon.com/research-credits/
- **AWS Machine Learning Research Awards (MLRA)**
  - https://aws.amazon.com/aws-ml-research-awards/
- **HPC on AWS for COVID-19 Research and Development**
  - https://aws.amazon.com/hpc/consortium/
- **AWS Diagnostic Development Initiative (DDI)**
  - https://aws.amazon.com/government-education/nonprofits/disaster-response/diagnostic-dev-initiative/
- **AWS Public Dataset Program**
  - https://aws.amazon.com/opendata/public-datasets/

AWS Services Support by Office of Research – Research IT

- **Pre-award and post-award partnership**
- Initial account setup
- Cost estimates for research proposals for budgeting
- Design, architect, and deployment of research project in the cloud
- Cost analysis and optimization
- Review of pre-existing cloud architectures
- Consulting for ML/Deep Learning
- Billing management
- **Certified AWS Solutions Architect in the team**

Website: https://rci.research.ucf.edu
Email: ResearchIT@ucf.edu

Regulated environment in AWS for Controlled Unclassified Information and HIPAA (CAFÉ)



Technology
Tools
Policies
Processes
Procedures
Guidelines
Resources
Documentation

IT
InfoSec
OCRM
Compliance
Proposal Mgrs
Contract Mgrs

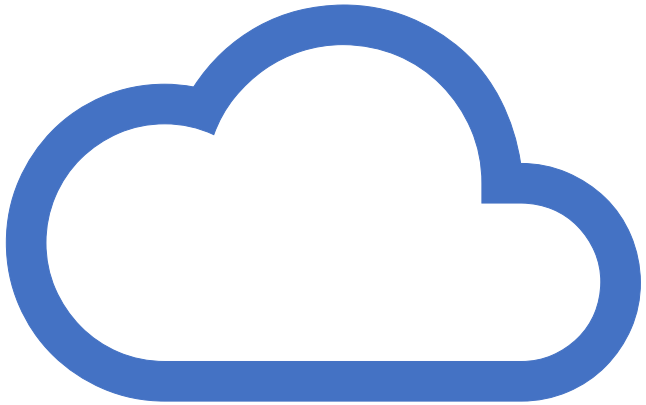
Google Cloud Platform (GCP) – on the Roadmap

- Internet2 Higher Ed members eligible for NET+ GCP
- Benefit of **pre-negotiated contract**
  - Pre-negotiated by teams from Indiana University, Michigan State University, Uni. of Washington and Washington Uni. in St. Louis
- Benefit of **pre-completed Security Assessment**
  - Higher Education Community Vendor Assessment Tool (HECVAT)
- Benefits for researchers: **Getting Started Package**
  - $40K worth research consulting, on-site training and onboarding
- For more information: https://www.internet2.edu/products-services/cloud-services-applications/google-cloud-platform/#service-netplus

Things to consider for Cloud Computing

- Research-driven services
  - Different Workloads => Different cloud computing and storage options
- IT and Infrastructure teams
  - Negotiating SLAs, managing vendor relationships, integration with infrastructure
- Institutional Departments
  - Improved processes for vendor assessments; use pre-negotiated agreements
- Things Researchers should think about while setting up their cloud experiments
  - Parallelizable code
  - Reproducible & Reusable research
  - Rapid development of technology (ML, AI, IoT)
  - Data movement and Data staging is very important in the cloud
  - What type and no. of resources needed and their location?
    - Can preemptible instances be used?
  - Should data be staged? Connectivity for staging the data in/out

Summary



- UCF Research Mission
- UCF Aspirations
  - Cloud Storage
  - Cloud Collaboration
  - Cloud Computing
- UCF Researcher Needs Assessment
- Current state of cloud computing services at UCF
- Food for Thought

References

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- Top Cloud Providers in 2020, https://www.zdnet.com/article/the-top-cloud-providers-of-2020-aws-microsoft-azure-google-cloud-hybrid-saas/
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Thank you!

- Questions?