



Research Computing in the Cloud: CU Research Computing Cloud Foundations Service

Research Computing in the Cloud

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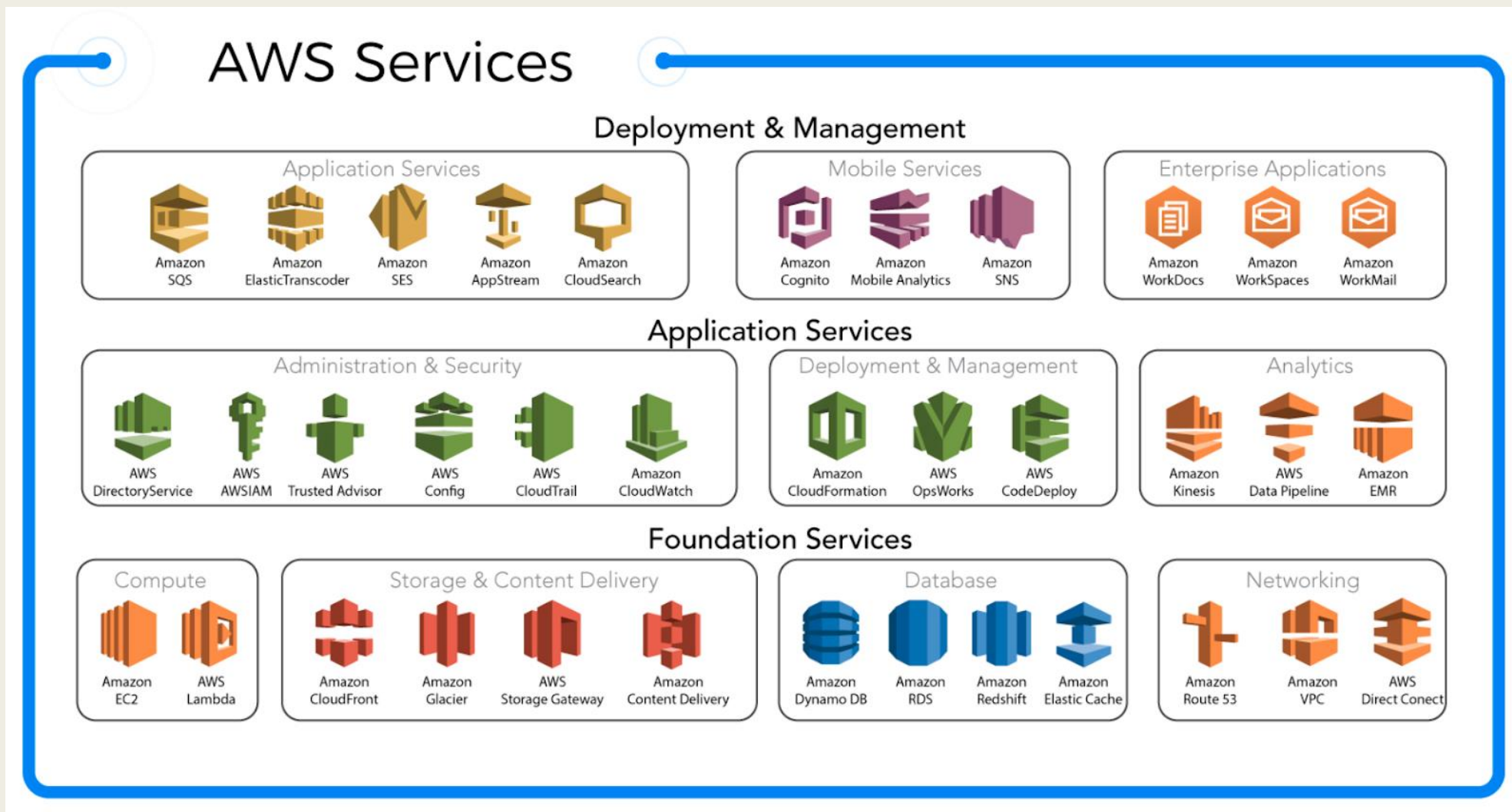
www.rc.colorado.edu

rc-help@colorado.edu

Outline

- Introduction to AWS
 - What is it?
 - Considerations
- What services do they offer?
 - *What specific tools are valuable in a research setting?*
- *How to get started*
- *Learning Materials*

What is AWS?



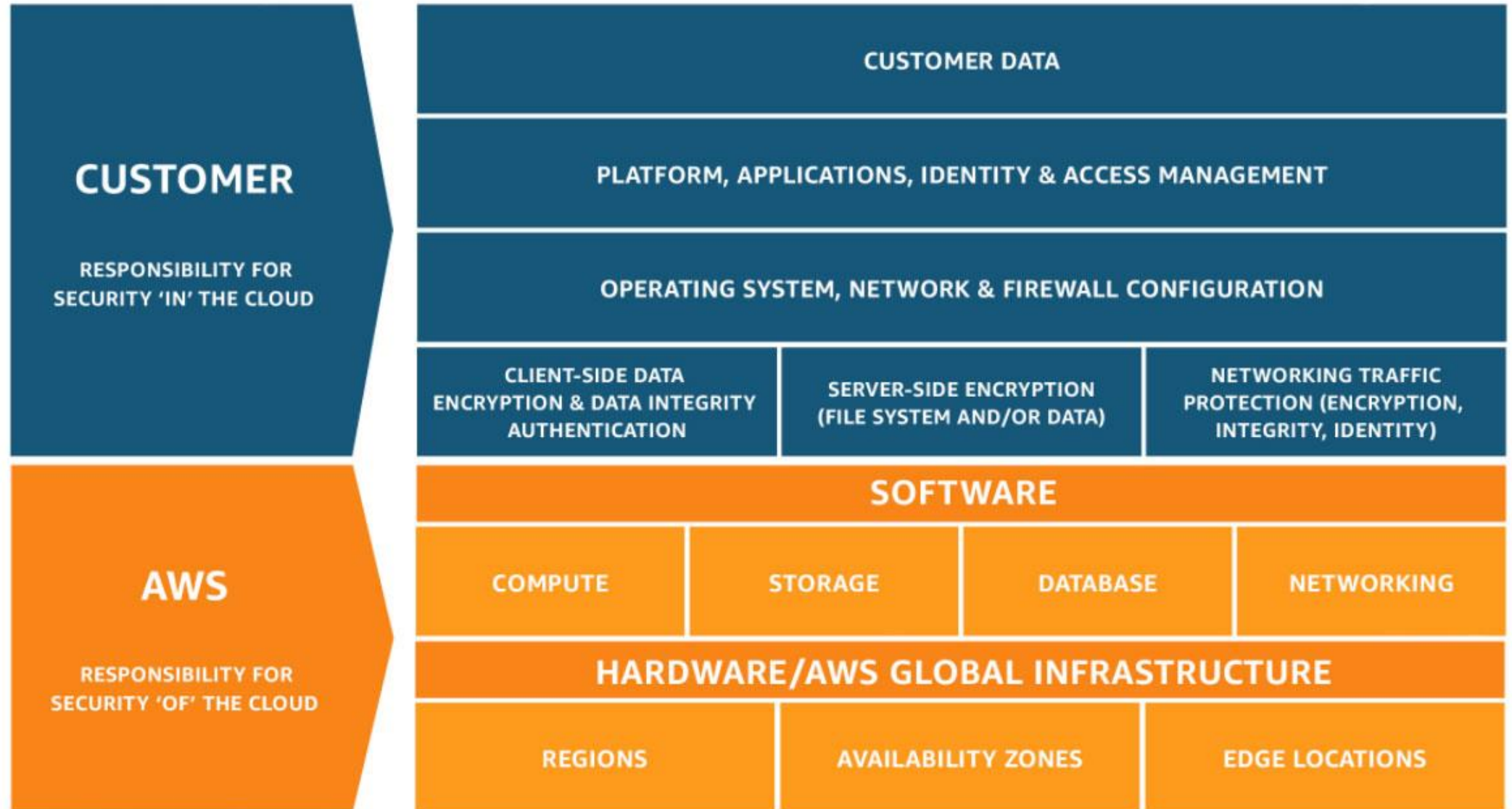


WHAT
SCARES YOU
ABOUT
WORKING IN
THE CLOUD?

Considerations

- [High Availability](#)
- Data Security
 - 99.9999999999% (11 9's) of data durability
- Quick and easy Scalability
- Getting closer to the data
- Wide array of Computing Power
- Cost Variability
- Alleviate operational burden

What are you responsible for?



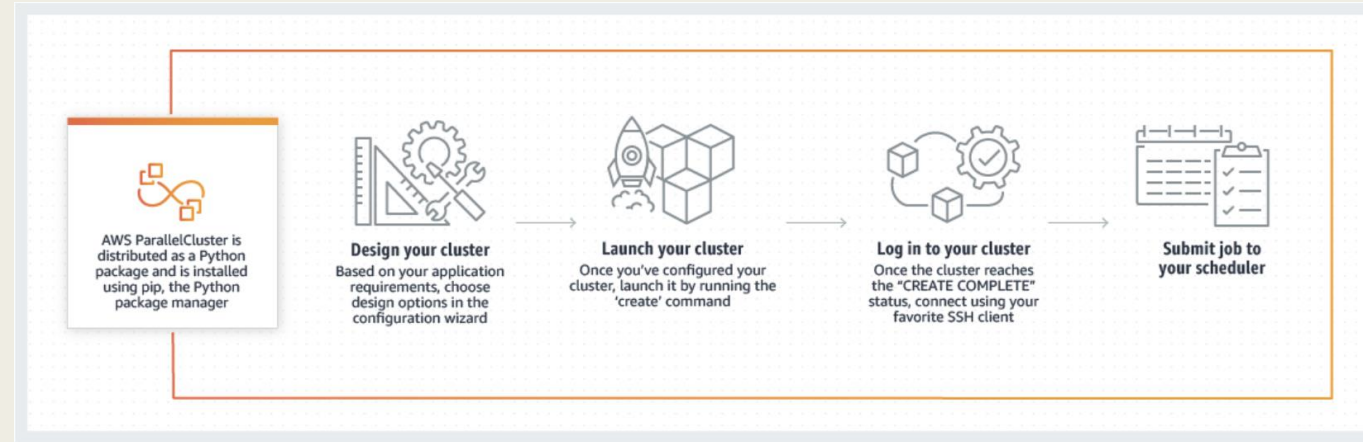
What tools are available?

- Conventional Cloud Computing Resources
 - Virtual Machines (EC2)
 - Storage (S3)
 - Databases (RDS or Dynamo)
- Quick Start Tools
 - Lightsail for Research

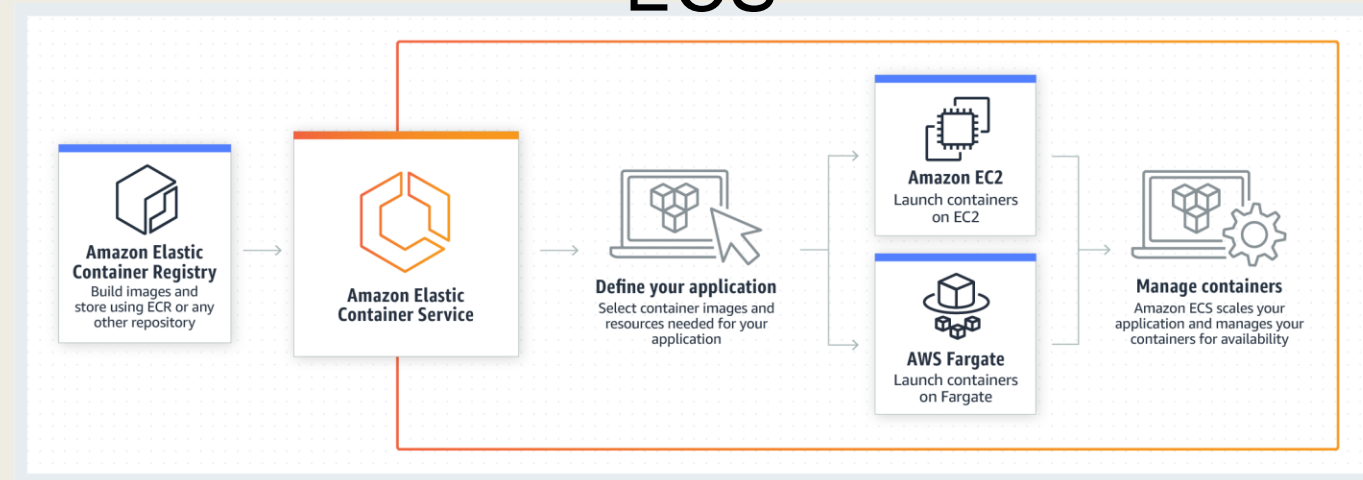
What tools are available?

- Advanced tools
 - Cluster Environments
 - Parallel cluster
 - Container Services
 - EKS, ECS

Parallel Cluster



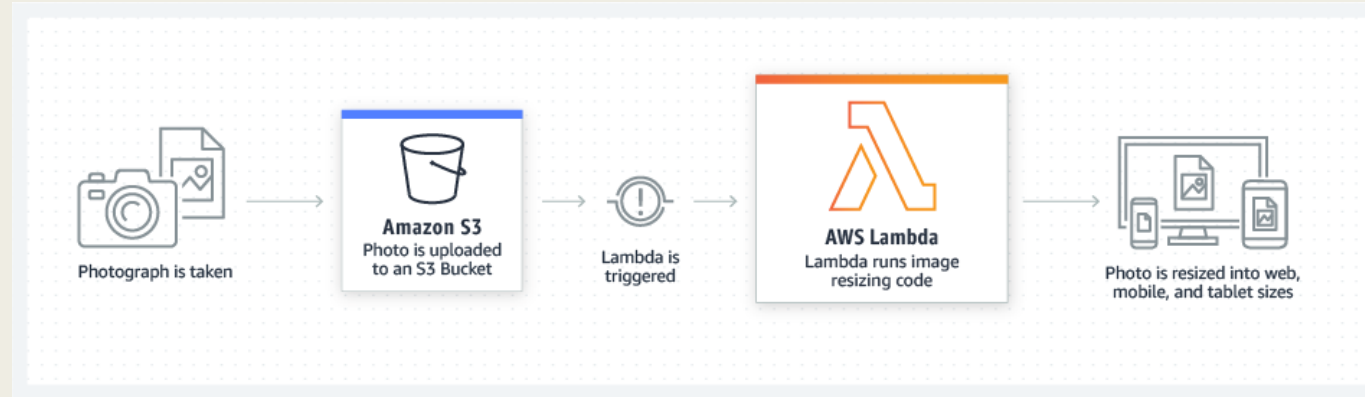
ECS



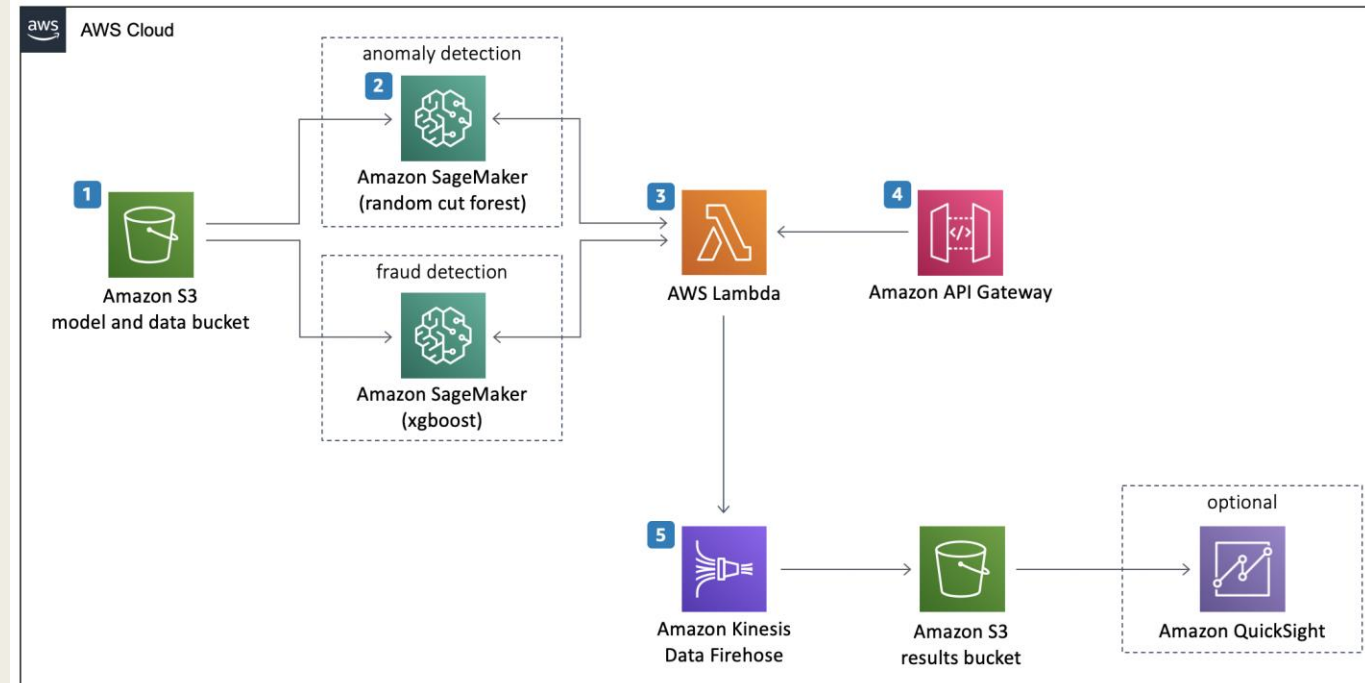
What tools are available?

- Advanced tools
 - Serverless code execution
 - Lambda
 - FPGA's
 - Machine Learning
 - Sagemaker, Rekognition, Polly, etc.

Lambda



Sagemaker



DEMO of Lightsail

<http://bit.ly/OIT-AWS>

How to get started

- Reach out to the Cloud Foundations Service at CU
 - rc-help@colorado.edu
- Provide access to centrally provisioned public cloud services for administrative, teaching & learning, and research needs. This includes new and existing applications, big data workloads and other workloads well suited to the major public cloud services.
- What info is required?
 - Your project details

How to get started

- What we Offer
 - Basic Security Guardrails
 - Billing against CU funds (Purchase Order)
 - Connection to internal CU resources
 - Federated Access
 - Support & Consulting

How to get started

- Free Trials offered by AWS
- AWS Free Tier



Q Search free tier products

COMPUTE	STORAGE	DATABASE
Free Tier 12 MONTHS FREE Amazon EC2 750 Hours per month Resizable compute capacity in the Cloud.	Free Tier 12 MONTHS FREE Amazon S3 5 GB of standard storage Secure, durable, and scalable object storage infrastructure.	Free Tier 12 MONTHS FREE Amazon RDS 750 Hours per month of database usage (applicable DB engines) Managed Relational Database Service for MySQL, PostgreSQL, MariaDB, or SQL Server.
DATABASE	MACHINE LEARNING NEW	COMPUTE
Free Tier ALWAYS FREE Amazon DynamoDB 25 GB of storage Fast and flexible NoSQL database with seamless scalability.	Free Tier FREE TRIAL Amazon SageMaker 2 Months free trial Machine learning for every data scientist and developer.	Free Tier ALWAYS FREE AWS Lambda 1 Million free requests per month Compute service that runs your code in response to events and automatically manages the compute resources for you.
ANALYTICS	ANALYTICS NEW	MOBILE
Free Tier FREE TRIAL Amazon Redshift 2 Month free trial Fast, simple, cost-effective data warehousing.	Free Tier 12 MONTHS FREE Amazon OpenSearch Service 750 Hours per month of a single-AZ t2.small.search or t2.micro.search instance. Managed service that makes it easy to use Amazon Elasticsearch Service.	Free Tier ALWAYS FREE Amazon SNS 1 Million publishes Fast, flexible, fully managed push messaging service.

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Learning Materials

- Countless sites with training tools
 - acloudguru.com
 - AWS Events on Campus
 - **Link to get notified**
 - AWS Educate
 - <https://aws.amazon.com/education/awseducate/>
 - Learning materials
 - Grants for free usage of AWS services (credits)

Closing Comments

- AWS is available for all users
- Azure (only available to OIT) and GCP (coming soon)
- Cloud Bursting
 - Currently in development
 - Reduces wait times
 - Need resources we don't have on-premise

HOW CAN YOU USE AWS IN YOUR RESEARCH?



Thank you!

- Contact: anwi7603@colorado.edu
- Help Desk: rc-help@colorado.edu
- Any Questions?