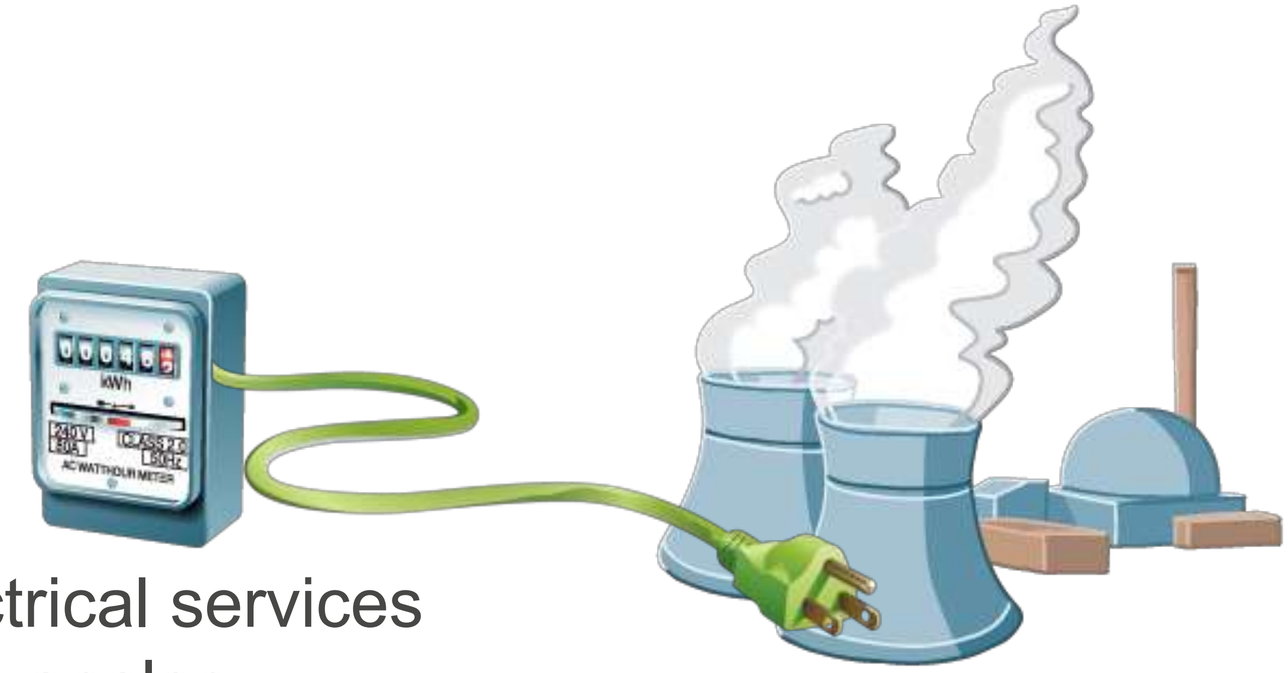
Amazon Web Services

“The cloud services companies of all sizes… The cloud is for everyone. The cloud is a democracy.”

–Marc Benioff, Founder, CEO and Chairman of Salesforce

What is cloud computing?

Cloud computing is on-demand delivery of IT resources and applications via the Internet with pay-as-you-go pricing.



Electrical services analogy

Cloud deployment Models

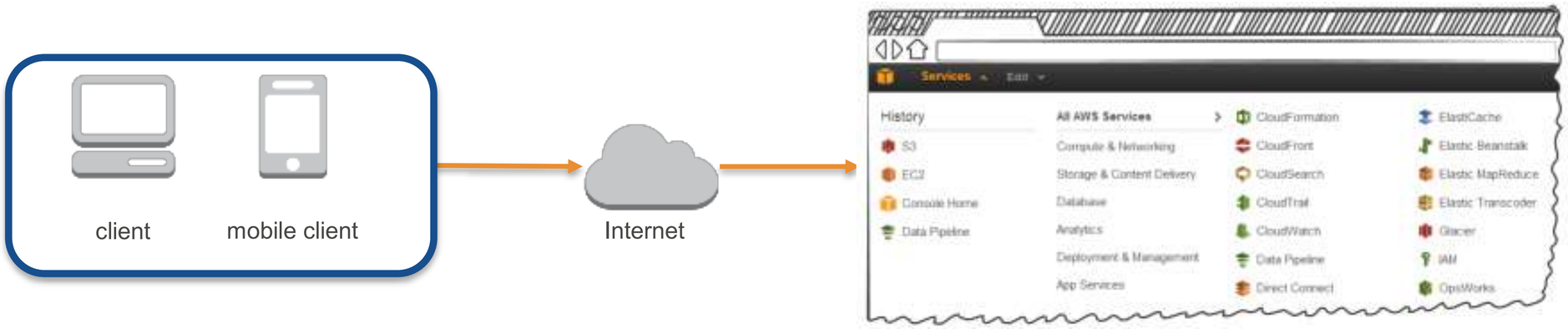
- **Public**:A cloud-based application is fully deployed in the cloud and all parts of the application run in the cloud. Applications in the cloud have either been created in the cloud or have been migrated from an existing infrastructure to take advantage of the benefits of cloud computing.

- **Private**: The deployment of resources on-premises, using virtualization and resource management tools, is sometimes called the “private cloud.” On-premises deployment doesn’t provide many of the benefits of cloud computing but is sometimes sought for its ability to provide dedicated resources.

- **Hybrid**: A hybrid deployment is a way to connect infrastructure and applications between cloud-based resources and existing resources that are not located in the cloud.

On-Demand Self Services & Broad Network Access

- User provisions computing resources as needed.
- User interacts with cloud service provider through an online control panel.
- Clear solutions are available through a variety of network-connected devices and over varying platforms.



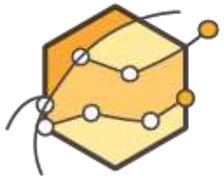
Advantages and Benefits of AWS Cloud Computing

Trade capital expense for variable expense.

Increase speed and agility.

Benefit from massive economies of scale.

Stop spending money on running and maintaining data centers.



Stop guessing capacity.

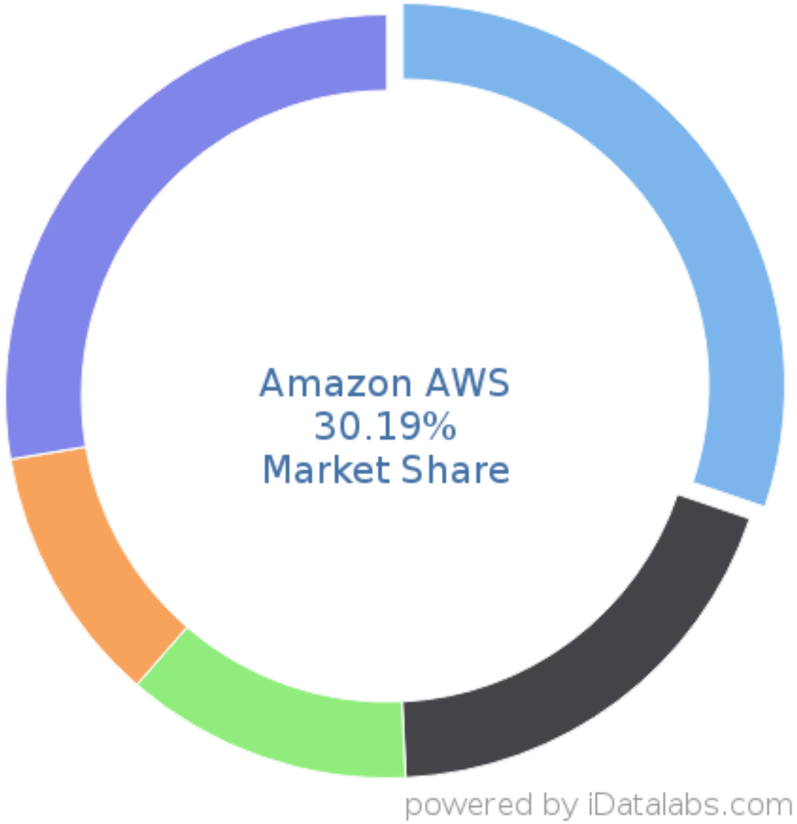
Go global in minutes.


AWS

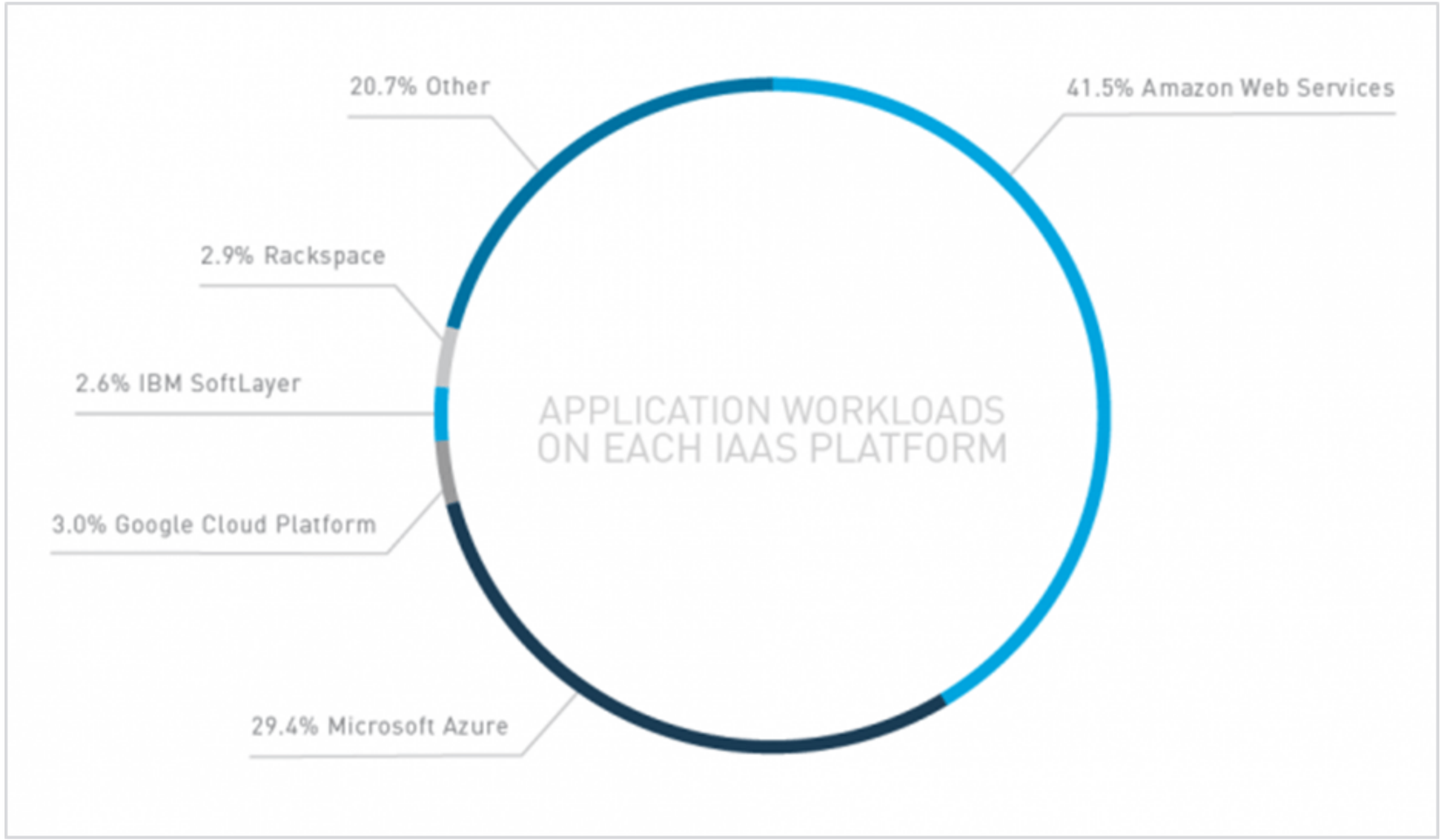
Cloud Platforms & Services

- Amazon AWS (30.19%)
- Windows Azure (19.06%)
- Rackspace (12.13%)

AWS's server capacity is about 6 times larger than the next 12 competitors combined.



Application Workloads



Gartners Magic Quadrant

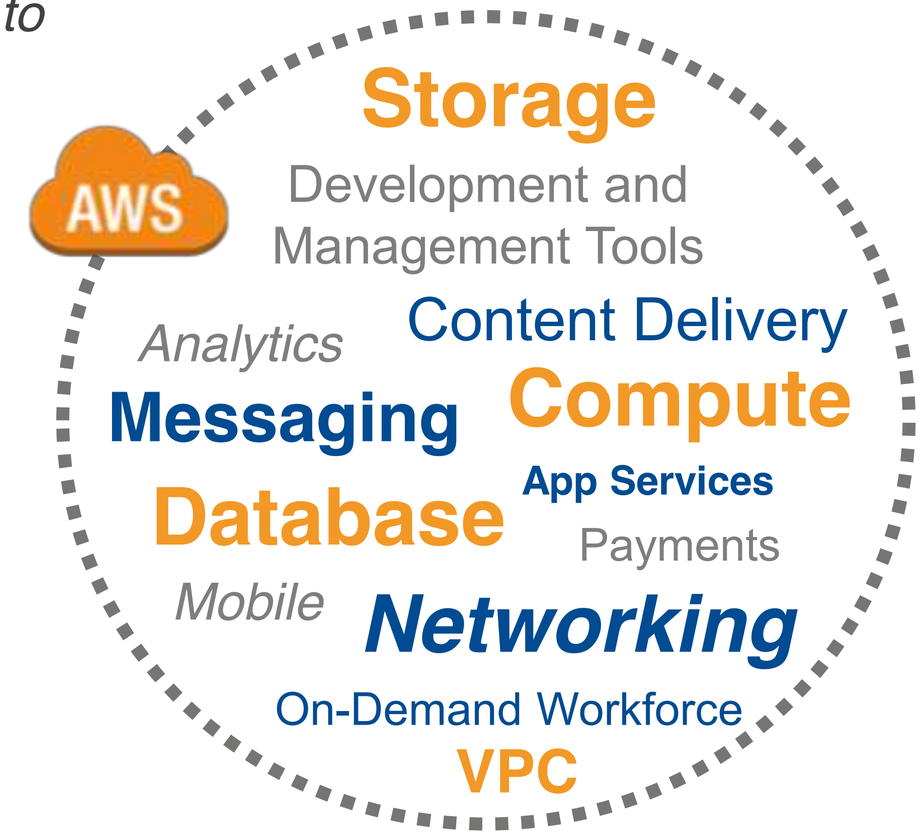
Figure 1. Magic Quadrant for Cloud Infrastructure as a Service, Worldwide

Source: Gartner (June 2017)

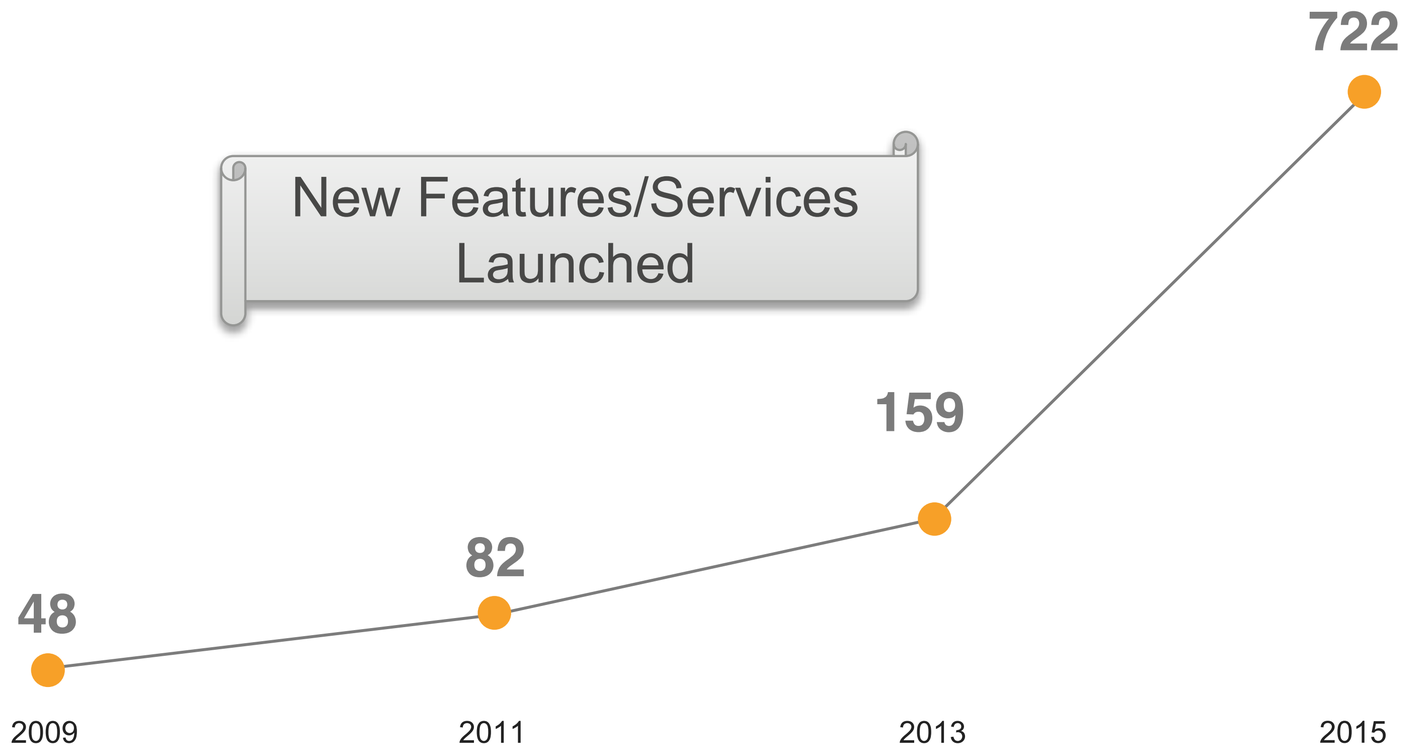
Amazon History

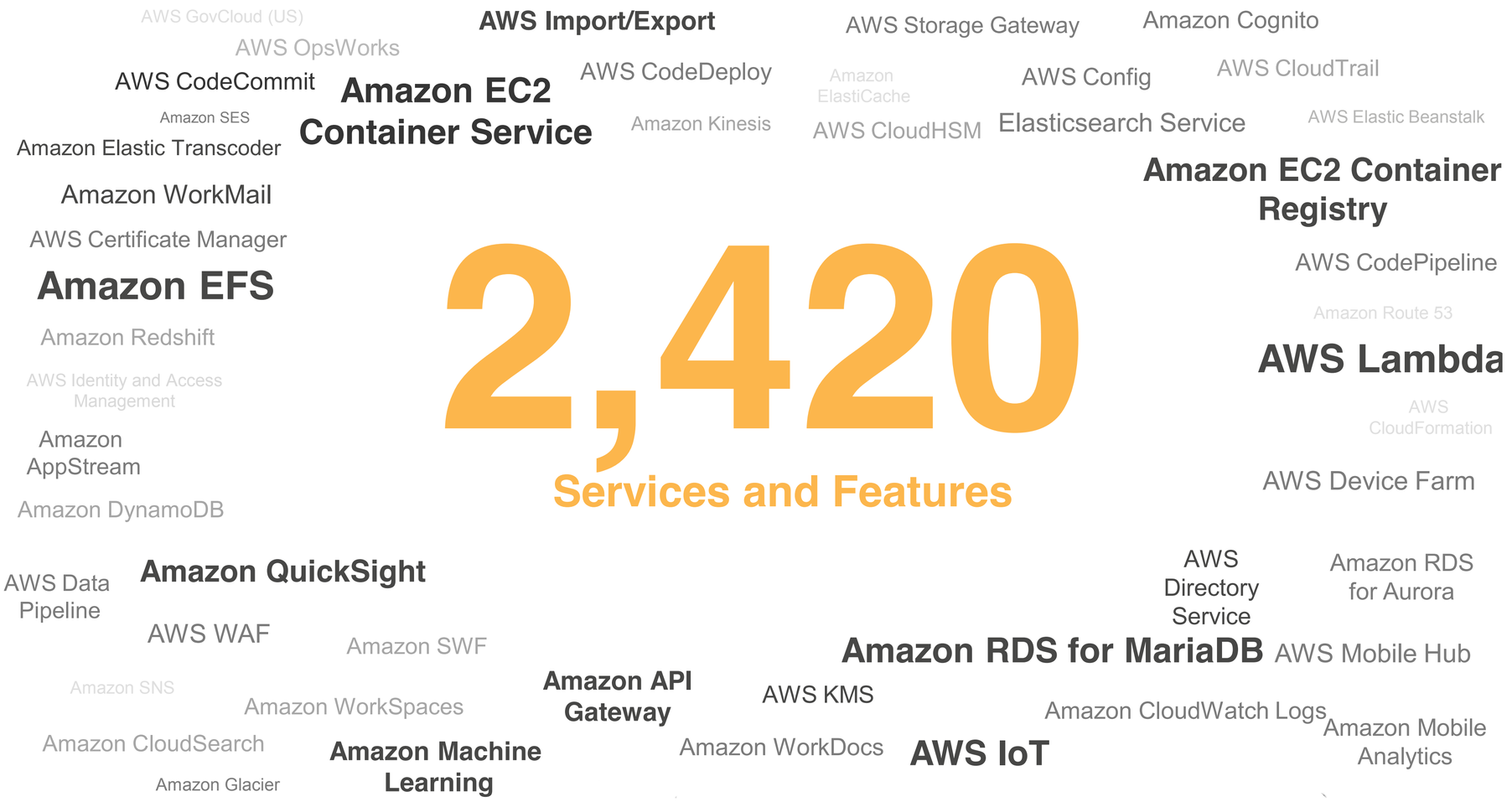
Amazon Web Services (AWS)

Enable businesses and developers to use web services to build scalable, sophisticated applications.

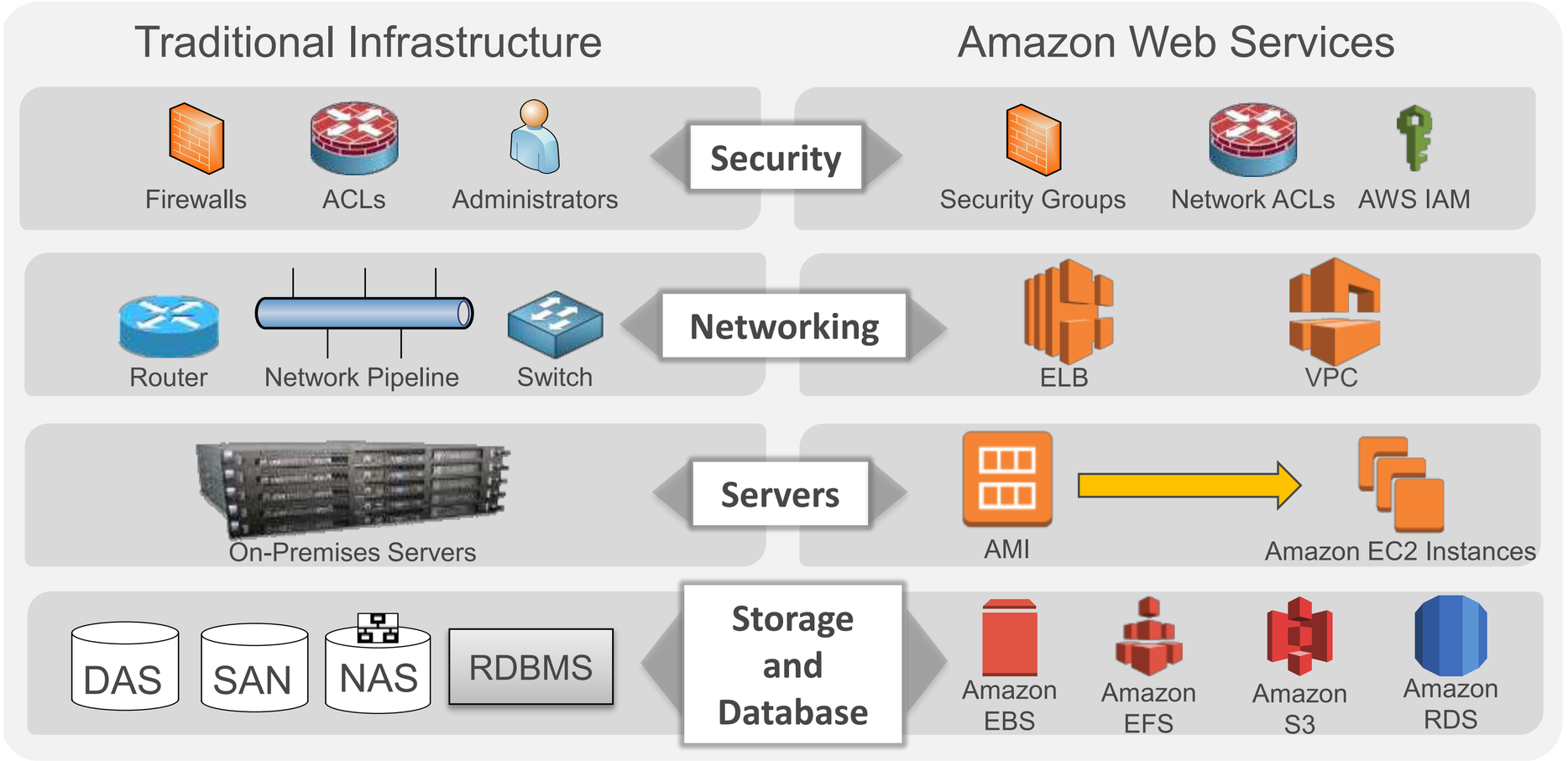


AWS Rapid Pace of Innovation

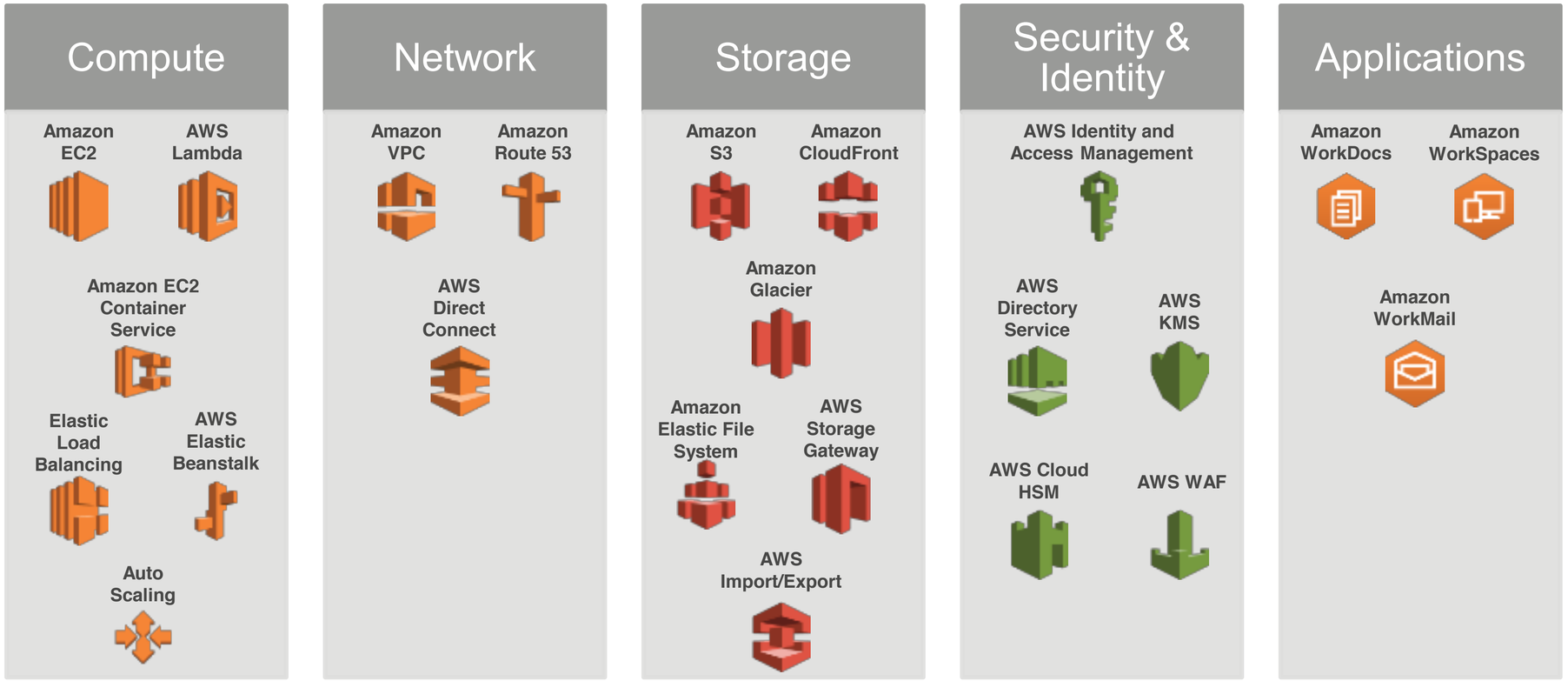



AWS GovCloud (US)
AWS Import/Export
AWS Storage Gateway
Amazon Cognito
AWS OpsWorks
AWS CodeCommit
Amazon EC2 Container Service
AWS CodeDeploy
Amazon ElastiCache
AWS Config
AWS CloudTrail
Amazon SES
Amazon Kinesis
AWS CloudHSM
Elasticsearch Service
AWS Elastic Beanstalk
Amazon Elastic Transcoder
Amazon EC2 Container Registry
Amazon WorkMail
AWS Certificate Manager
2,420
Services and Features
AWS CodePipeline
Amazon Route 53
Amazon EFS
AWS Lambda
Amazon Redshift
AWS Identity and Access Management
AWS CloudFormation
Amazon AppStream
AWS Device Farm
Amazon DynamoDB
AWS Data Pipeline
Amazon QuickSight
AWS Directory Service
Amazon RDS for Aurora
AWS WAF
Amazon SWF
Amazon RDS for MariaDB
AWS Mobile Hub
Amazon SNS
Amazon API Gateway
AWS KMS
Amazon WorkSpaces
Amazon CloudWatch Logs
Amazon Mobile Analytics
Amazon CloudSearch
Amazon Machine Learning
Amazon WorkDocs
AWS IoT
Amazon Glacier

AWS Core Infrastructure and Services



AWS Foundation Services



AWS Global Infrastructure

Regions

- Geographic locations
- Consist of **at least two** Availability Zones

Availability Zones

- Clusters of data centers
- **Isolated from failures** in other Availability Zones

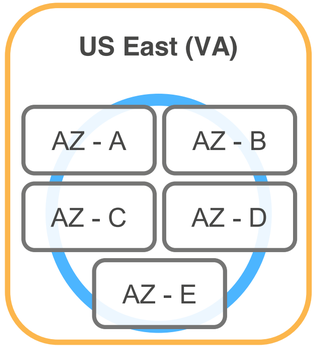
AWS Global Infrastructure

AWS Global Infrastructure

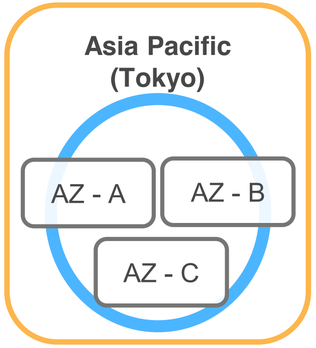
At least 2 Availability Zones per region.

Examples:

- US East (N. Virginia)
  - us-east-1a
  - us-east-1b
  - us-east-1c
  - us-east-1d
  - us-east-1e

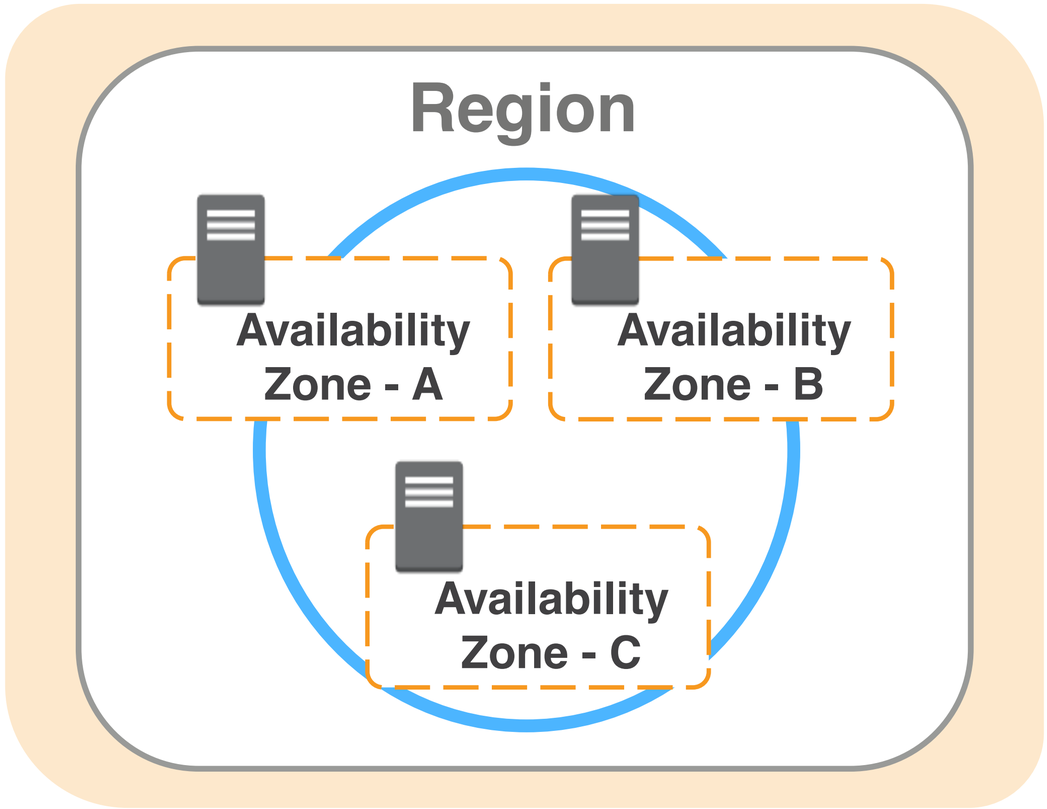


- Asia Pacific (Tokyo)
  - ap-northeast-1a
  - ap-northeast-1b
  - ap-northeast-1c



Note: Conceptual drawing only. The number of Availability Zones (AZ) may vary.

High Availability Using Multi-AZ Deployments



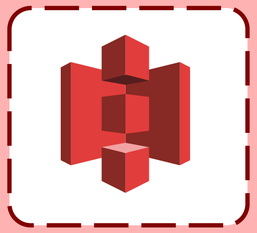
AWS Global Infrastructure

50+ AWS Edge locations - local points of presence commonly supporting AWS services like:

- Amazon Route 53 
- Amazon CloudFront 

Storage Services
Amazon S3

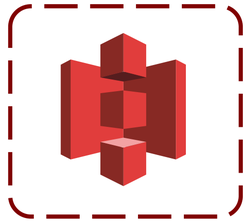
Amazon Simple Storage Service (S3)



Amazon S3

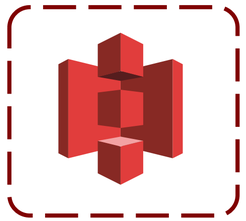
- Storage for the Internet
- Natively online, HTTP access
- Storage that allows you to store and retrieve **any amount of data**, any time, from anywhere on the web
- **Highly scalable**, reliable, fast and durable

Amazon S3 Facts



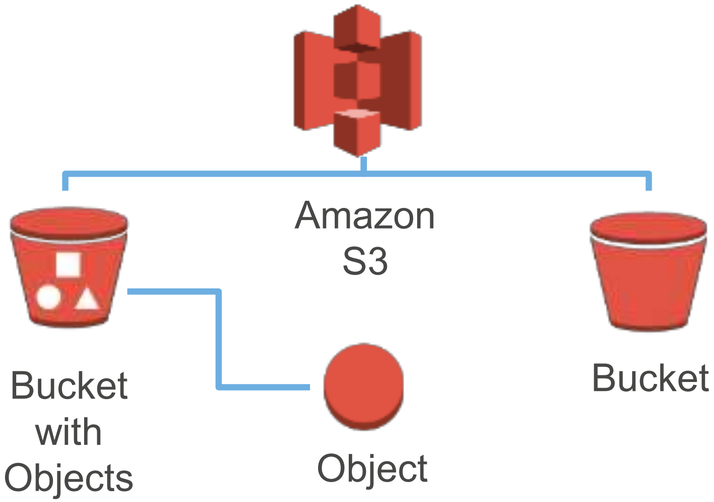
- Can store an **unlimited number of objects** in a bucket
- Objects can be **up to 5 TB**; no bucket size limit
- Designed for **99.999999999%** durability and **99.99%** availability of objects over a given year
- Can use **HTTP/S** endpoints to store and retrieve any amount of data, at any time, from anywhere on the web
- Is highly scalable, reliable, fast, and inexpensive
- Can use optional server-side **encryption** using AWS or customer-managed provided client-side encryption
- Auditing is provided by access logs
- Provides standards-based **REST** and SOAP interfaces

Common Use Scenarios



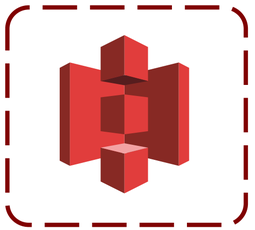
- Storage and backup
- Application file hosting
- Media hosting
- Software delivery
- Store AMIs and snapshots

Amazon S3 Concepts



- Amazon S3 stores data as objects within **buckets**
- An object is composed of a file and optionally any **metadata** that describes that file
- You can have **up to 100 buckets** in each account
- You can **control access** to the bucket and its objects

Amazon S3 Security



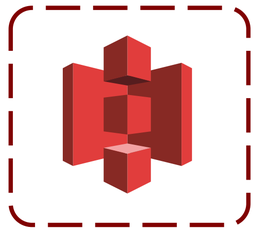
- You can **control access** to buckets and objects with:
  - Access Control Lists (ACLs)
  - Bucket policies
  - Identity and Access Management (IAM) policies
- You can upload or download data to Amazon S3 via **SSL** encrypted endpoints.
- You can **encrypt data** using AWS SDKs.

Amazon S3 Object Lifecycle

Lifecycle management defines how Amazon S3 manages objects during their lifetime. Some objects that you store in an Amazon S3 bucket might have a well-defined lifecycle:

- Log files
- Archive documents
- Digital media archives
- Financial and healthcare records
- Raw genomics sequence data
- Long-term database backups
- Data that must be retained for regulatory compliance

Amazon S3 Pricing



- Pay only for what you use
- No minimum fee
- Prices based on location of your Amazon S3 bucket
- Estimate monthly bill using the **AWS Simple Monthly Calculator**
- Pricing is available as:
  - Storage Pricing
  - Request Pricing
  - Data Transfer Pricing: data transferred out of Amazon S3

Amazon Glacier

- Long term low-cost archiving service
- Optimal for infrequently accessed data
- Designed for 99.999999999% durability
- Three to five hours’ retrieval time
- Less than $0.01 per GB/month (depending on region)

Amazon S3 Storage Classes

Storage Class	Durability	Availability	Other Considerations
Amazon S3 Standard	99.999999999%	99.99%	
Amazon S3 Standard - Infrequent Access (IA)	99.999999999%	99.9%	• Retrieval fee associated with objects • Most suitable for infrequently accessed data
Glacier	99.999999999%	99.99% (once restored)	• Not available for real-time access • Must restore objects before you can access them • Restoring objects can take 3-5 hours

“Invention requires two things:

1. *The ability to try a lot of experiments,*
2. *and not having to live with the collateral damage of failed experiments”*

–Andy Jassy, CEO Amazon Web Services

Thank You!