



## Cloud and Storage

Transforming IT with AWS and Zadara

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Network

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STORAGE COMPETENCY

# What sets AWS apart?



Security

Fine-grained control



Service Breadth & Depth; pace of innovation

100+ services to support any cloud workload; rapid customer driven releases



Experience: 1M+ customers

Building and managing cloud since 2006



Global Footprint

The AWS Cloud spans 54 Availability Zones within 18 geographic Regions and 1 Local Region  
114 POPs (103 Edge Locations and 11 Regional Edge Caches)



Machine Learning

Integrated in AWS.  
Machine learning in the hands of every developer and data scientist.



Ecosystem

Thousands of partners; 4,200+ Marketplace products from 4,200 software listings from more than 1,280 ISVs



Enterprise leader

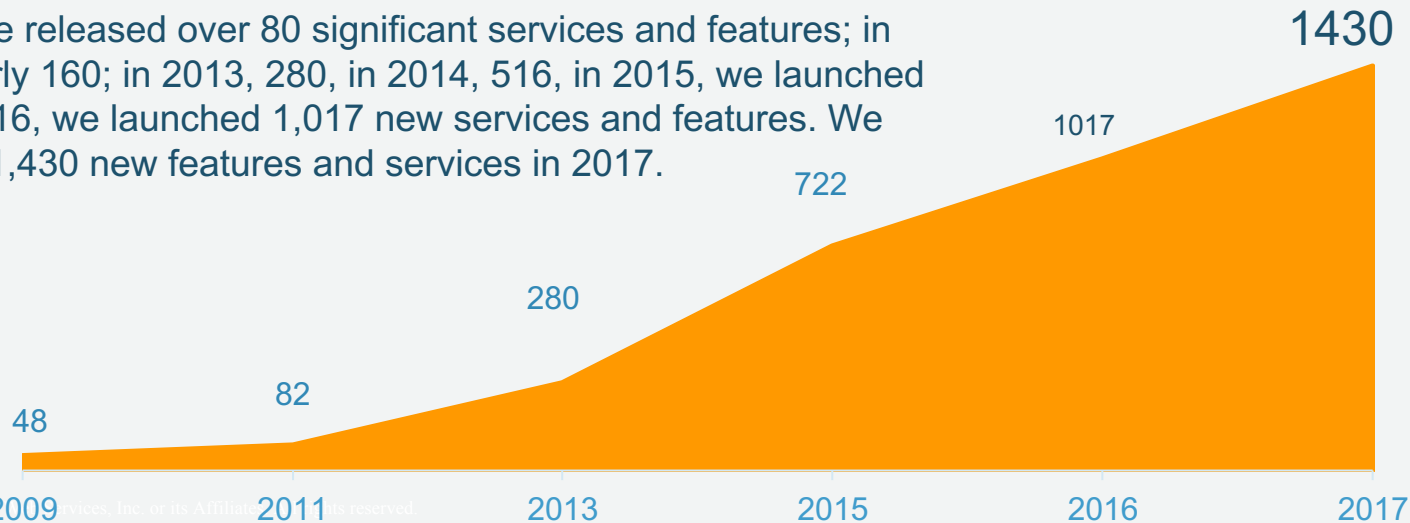
AWS positioned as a Leader in the Gartner Magic Quadrant for Cloud Infrastructure as a Service, Worldwide\*

# AWS' History of Innovation

## Customer-driven services and features

AWS has been continually expanding its services to support virtually any cloud workload, and it now has more than 100 services that range from compute, storage, networking, database, analytics, application services, deployment, management, developer, mobile, Internet of Things (IoT), Artificial Intelligence (AI), security, hybrid and enterprise applications.

In 2011, we released over 80 significant services and features; in 2012, nearly 160; in 2013, 280, in 2014, 516, in 2015, we launched 722. In 2016, we launched 1,017 new services and features. We launched 1,430 new features and services in 2017.



# Experience with Operational Reliability

Millions of active customers use AWS



“There is no compression algorithm for experience.”

Over a decade building the most reliable, secure, scalable, and cost-effective infrastructure.

Availability Zones exist on isolated fault lines, flood plains, networks, and electrical grids to substantially reduce the chance of simultaneous failure.

# Global Infrastructure

● Region & Number of AZ

## US East

N. Virginia (6),  
Ohio (3)

## US West

N. California (3),  
Oregon (3)

## Asia Pacific

Mumbai (2),  
Seoul (2),  
Singapore (3),  
Sydney (3),  
Tokyo (4),  
Osaka-Local (1),

## Canada

Central (2)

## China

Beijing (2),  
Ningxia (3)

## Europe

Frankfurt (3),  
Ireland (3),  
London (3),  
Paris (3)

## South America

São Paulo (3)

## AWS GovCloud

US-West (3)

○ Coming Soon

Bahrain  
Hong Kong  
SAR, China  
Sweden  
AWS GovCloud  
(US-East)



# The AWS Storage Portfolio

## Block



Amazon EBS  
(persistent)



Amazon EC2  
Instance Store  
(ephemeral)

## File

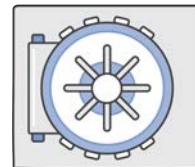


Amazon EFS

## Object



Amazon S3

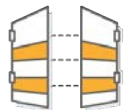


Amazon Glacier

## Cloud Data Migration



Snowball  
Snowball Edge  
Snow Mobile



Storage  
Gateway



Direct Connect



3<sup>rd</sup> Party  
Connectors



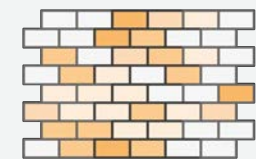
Transfer  
Acceleration



Kinesis  
Firehose



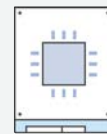
# Amazon EBS



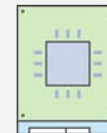
**AWS  
block storage  
offerings**



**EC2  
instance  
store**



**EBS  
SSD-backed  
volumes**



**gp2**

**io1**

**EBS  
HDD-backed  
volumes**



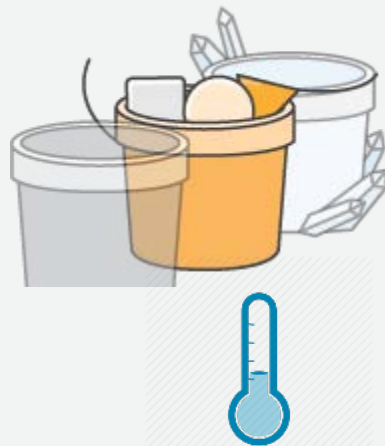
**st1**

**sc1**

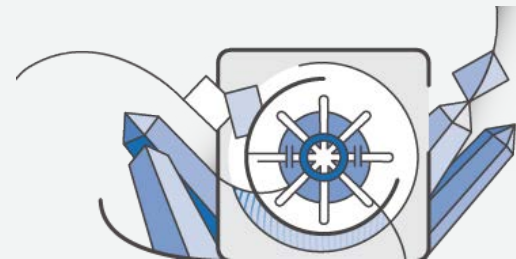
# Choice of storage classes on Amazon S3



S3 Standard



S3 Standard - Infrequent Access  
S3 One Zone – Infrequent Access\*



Amazon Glacier

Active data

Milliseconds

\$0.021/GB/mo

Infrequently accessed data

Milliseconds

\$0.0125/GB/mo

Archive data

Minutes to Hours

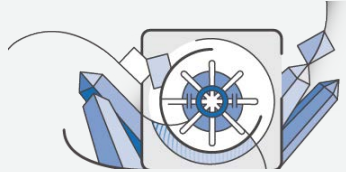
\$0.004/GB/mo



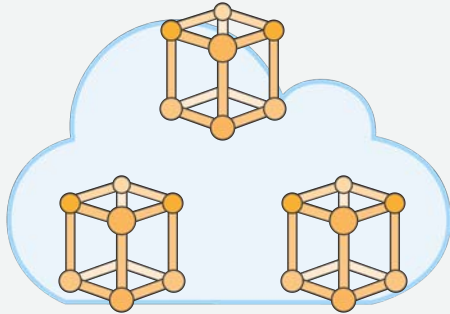
# Amazon S3 and Glacier Durability



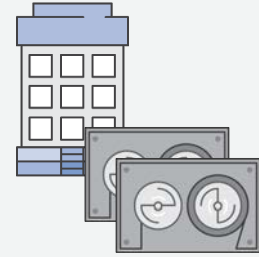
S3 – IA



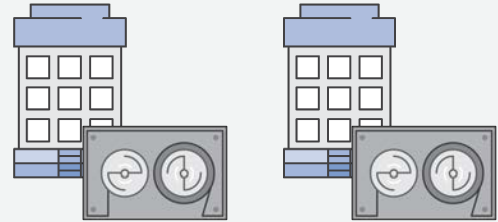
Glacier



11 9s durability



4 9s durability



5 9s durability

# Glacier Retrievals: Expedited and Bulk Retrievals

- Expedited: designed for occasional urgent access to a small number of archives
- Standard: Low-cost option for retrieving data in just a few hours
- Bulk: Lowest cost option optimized for large retrievals, up to petabytes of data in 12 hours
- Three flexible and powerful retrieval options to access any of your Glacier data

|                    | <b>Expedited</b>   | <b>Standard</b>           | <b>Bulk</b>                |
|--------------------|--------------------|---------------------------|----------------------------|
| Data Access Time   | 1 - 5 minutes      | 3 - 5 hours               | 5 - 12 hours               |
| Data Retrievals    | \$0.03 per GB      | \$0.01 per GB             | \$0.0025 per GB            |
| Retrieval Requests | \$0.01 per request | \$0.05 per 1,000 requests | \$0.025 per 1,000 requests |

# With all the AWS Storage Options, **why Zadara** at AWS?



- **Advanced File Services** (SMB/NFS, AD)
- **Lift-and-Shift** of existing applications
- **Dedicated SSDs and HDDs**
- **Automatic Backup to Object Storage**
- **Edge & Hybrid Clouds** feeding AWS
- **Live Hydration:** PBs into AWS, quickly and with minimal disruption

... and **24x7 Live Support** – included

# How Zadara Extends AWS' Capabilities

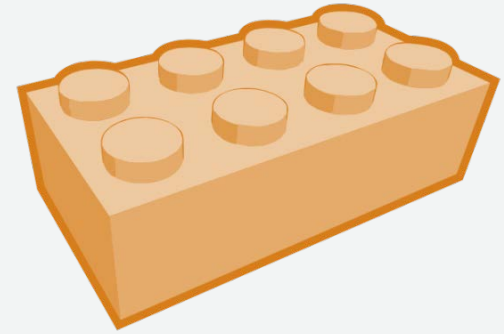
|                  |                                   | AWS<br>EFS / EBS / PIOPS | AWS + Zadara<br>VPSA Storage Array |
|------------------|-----------------------------------|--------------------------|------------------------------------|
| NAS & SAN        | Universal File Protocol Support   | NFS Only                 | <b>NFS + SMB</b>                   |
|                  | Active Directory ACLs             | ✗                        | ✓                                  |
|                  | Large File Volumes                | <b>PBs</b>               | <b>200 TB</b>                      |
|                  | Large Block Volumes               | 16 TB                    | <b>200 TB</b>                      |
| Privacy          | Encryption of Data-at-Rest        | ✓                        | ✓                                  |
|                  | Customer-Managed Encryption Keys  | S3 / EBS Only            | ✓                                  |
|                  | Dedicated, On-Demand Hardware     | ✗                        | ✓                                  |
| Perform.         | High IOPS per Volume              | 20K (PIOPS)              | <b>150,000</b>                     |
|                  | SSD/HDD Selection                 | EBS Only                 | ✓                                  |
|                  | Embedded Containers               | ✗                        | ✓                                  |
| Any <sup>3</sup> | On-Premises / Hybrid Cloud Option | ✗                        | ✓                                  |
|                  | Multi-Cloud Access                | ✗                        | ✓                                  |
| HA/DR            | Clusters/Sharing                  | ✗                        | ✓                                  |
|                  | Instant Snapshots & Clones        | ✗                        | ✓                                  |
|                  | Remote Replication                | ✗                        | ✓                                  |
|                  | Availability SLA                  | 99.95%                   | <b>100%</b>                        |



# Zadara at AWS **Block** Use Cases

## **Failover Clustering** of Microsoft SQL/mysql:

- Microsoft Failover Cluster
- Linux (e.g., Red Hat) Failover Cluster



**High IOPS:** Up to 150K per volume

**Highly Consistent IOPS:** extremely stable at ~3% over time

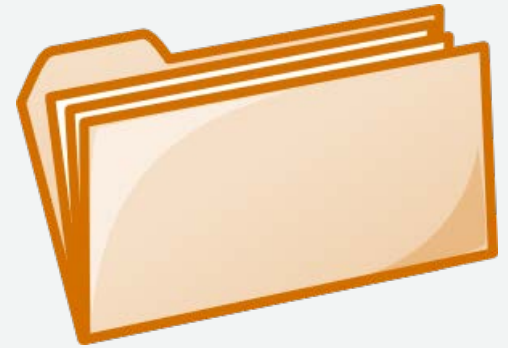
**Multi-AZ access:** a single volume can be accessed from all Azs

**Multi-VM access:** share a single volume among multiple VMs

**BC/DR:** region-to-region replication of block volumes

**Instant Snapshots and Clones:** non-impactful and zero capacity

# Zadara at AWS **File** Use Cases



## **Windows environments:**

- CIFS file system
- Active Directory

**Linux environments:** NFS file system (especially in the 7 regions where EFS is not available)

**Mixed environments:** simultaneous support for NFS & CIFS

**BC/DR:** region-to-region replication of file shares

**Backup to S3:** built-in, simple and affordable

**HDD Support:** for large-capacity, non-performance-critical storage

Available in the



### Zadara Storage Cube - 60TB Block and File storage

★★★★★ (0) | Version 16.05\* | Sold by [Zadara Storage, Inc.](#)

Starting from **\$7.99/hr** or from **\$55,994.00/yr** (20% savings) for software + AWS usage fees

The Zadara Storage 60TB Cube is a cloud-based Enterprise NAS virtual appliance with an NFS / CIFS server, dual HA controllers, dedicated high performance drives and enterprise...

Linux/Unix, Amazon Linux 2016.03.3 - 64-bit Amazon Machine Image (AMI)



### Zadara Storage Cube - 1.6TB SSD block and file storage

★★★★★ (0) | Version 16.05 | Sold by [Zadara Storage, Inc.](#)

Starting from **\$1.49/hr** or from **\$10,442.00/yr** (20% savings) for software + AWS usage fees

The Zadara Storage 1.6TB SSD Cube is a cloud-based Enterprise NAS virtual appliance with an NFS / CIFS server, dual HA controllers, dedicated high performance drives and enterprise...

Linux/Unix, Amazon Linux 2016.03 - 64-bit Amazon Machine Image (AMI)



# Customer Example



## Customer Profile:

think Procurement is the leader in innovative e-procurement solutions and procurement services



## Challenge

- Deploy an out-of-cloud copy of their data for **disaster recovery** and availability purposes
  - Maintain legal **security** and **privacy** commitments
- 

## Solution

- AWS & Zadara partner RedBear IT leveraged Zadara's VPSA Storage Array to solve customer challenges.
- 

## Results

- **Saved hundreds of thousands of dollars** leveraging Storage-as-a-Service (STaaS)
- Addressed DR, scalability, privacy, and security requirements