

# AWS Architecture Training S3

Amazon Simple Storage Service

Module 6

# Module Overview

- 📦 S3 Features
- 📦 S3 Concepts
- 📦 S3 Namespace
- 📦 S3 Pricing
- 📦 S3 Use Cases



# Amazon Simple Storage Service

- Amazon S3: [Simple Storage Service](#)
- Highly scalable data storage in-the-cloud
- Programmatic access via web services API
- Is a Web Store, not a file system
  - Optimized for WORM
  - Eventually consistent
- Fast, highly available and durable
- Economical

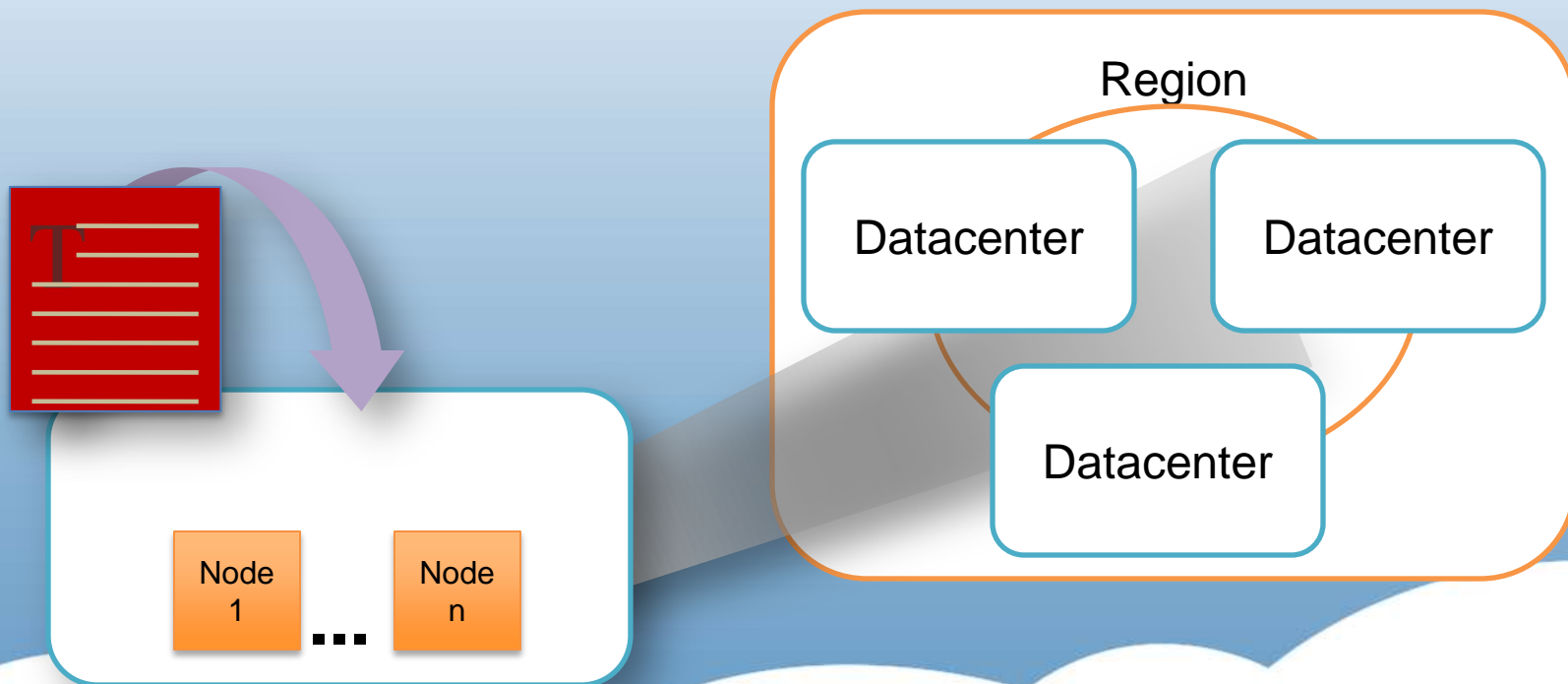
# EBS and S3 -What's the Difference?

	EBS Standard	Amazon S3
Paradigm	File system	Object store
Performance	Very, very fast	Very fast
Redundancy	Within data center	Across data centers
Security	Visible only to your EC2	Public Key / Private Key
Pricing	\$0.10/GB/month <u>allocated</u>	\$0.125/GB/month <u>stored</u>
Access from the Net?	No(2)	Yes(1)
Typical use case	It's a disk drive	Write once, read many

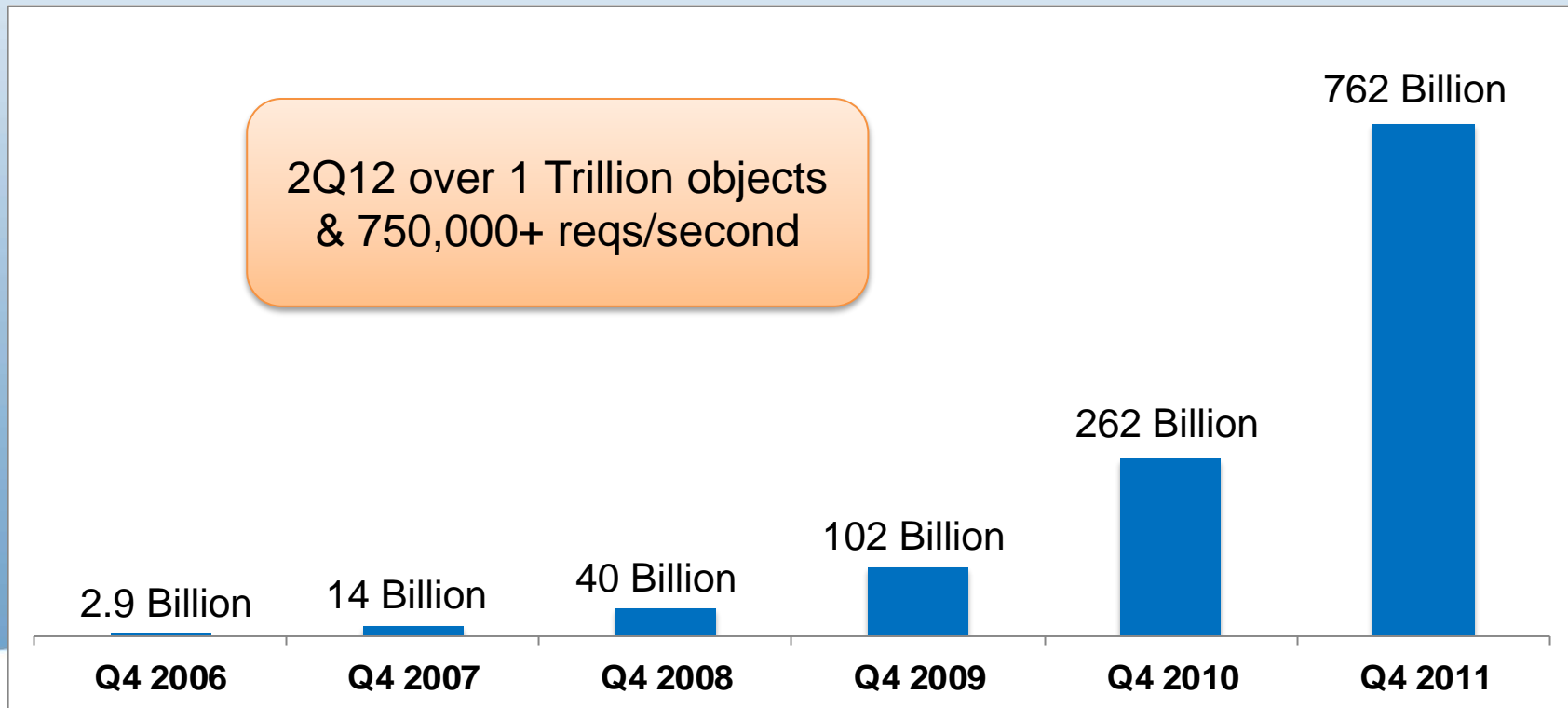
- (1) Only with proper credentials, unless ACLs are world readable
- (2) Accessible from Net if mounted to server and set up as FTP, etc.

# Designed for 99.999999999% Durability

Note: Conceptual drawing only. Actual number of nodes & datacenters may vary

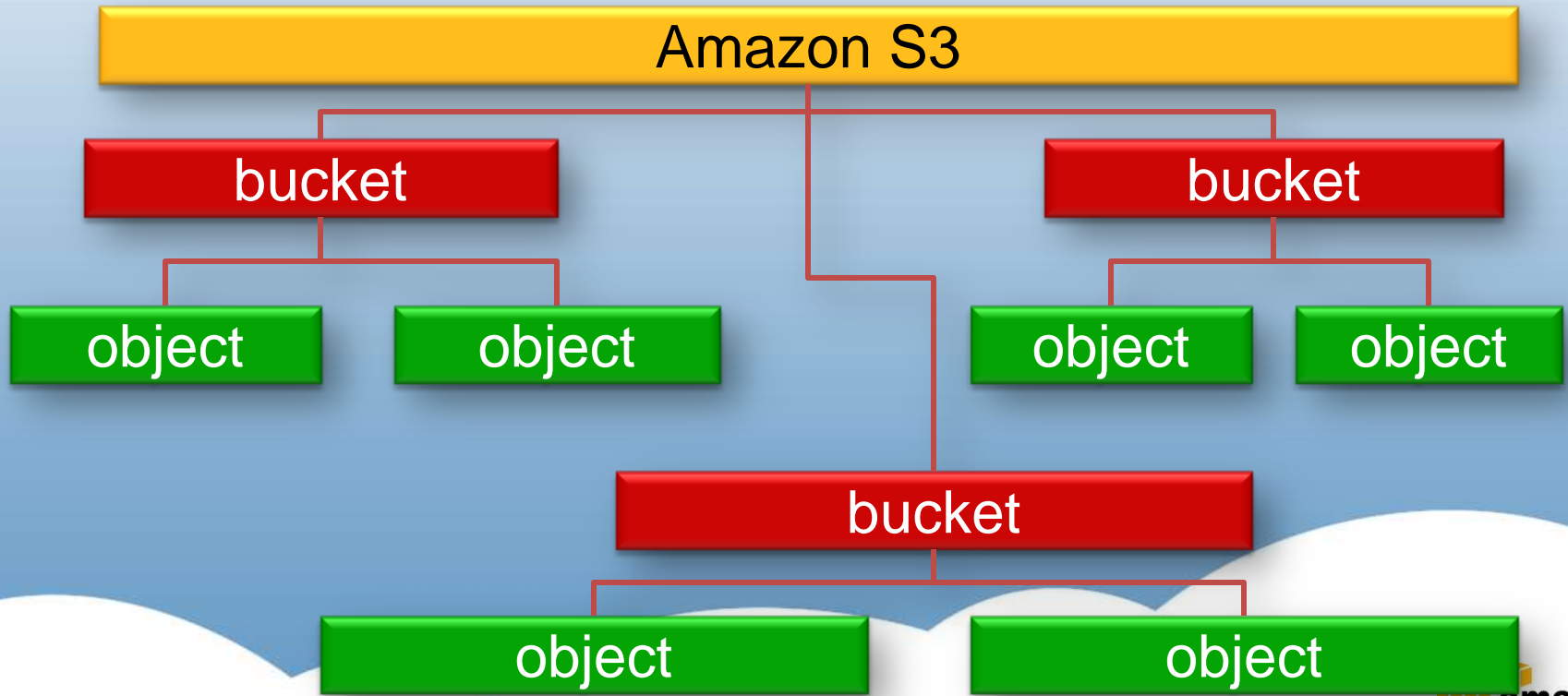


# The Cloud Scales: Amazon S3 Growth

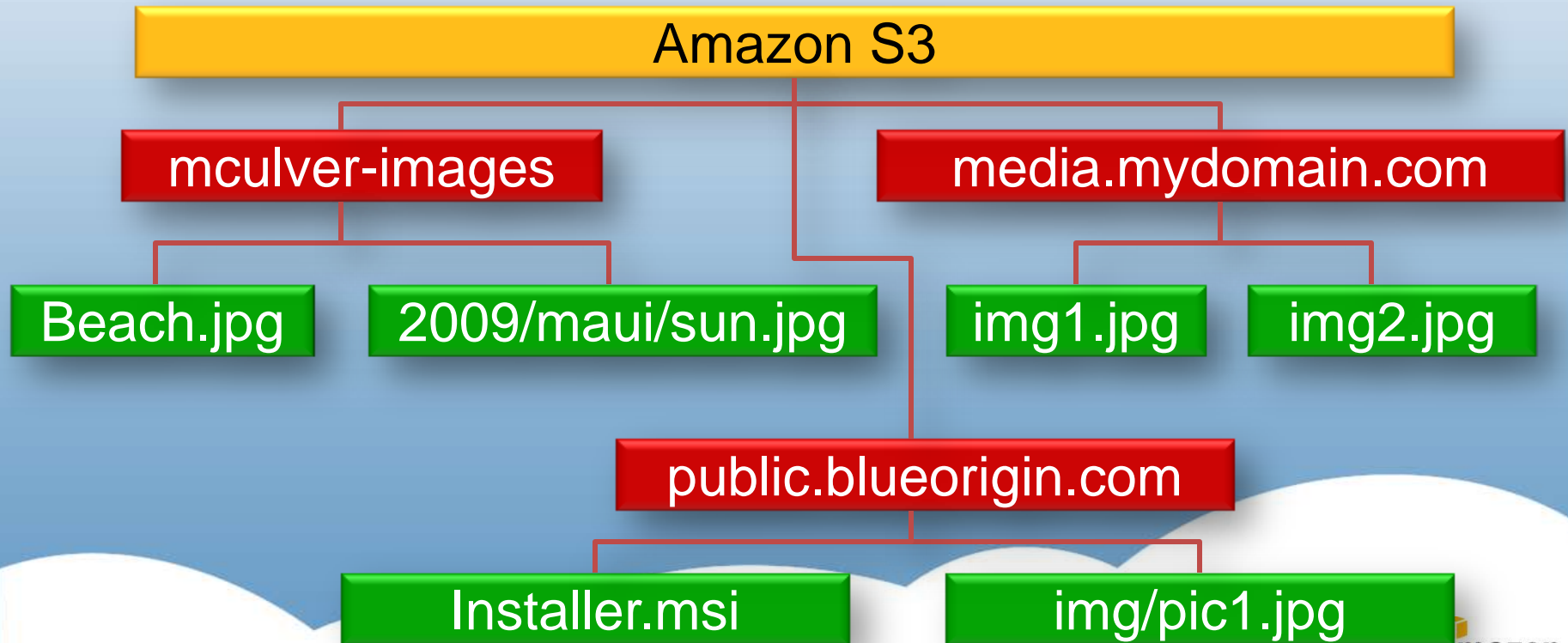


Total Number of Objects Stored in Amazon S3

# Amazon S3 Namespace



# Amazon S3 Namespace





# Reduced Redundancy Storage Saves \$\$

- 📦 Designed to provide 99.99% durability and 99.99% availability of objects over a given year
- 📦 This durability level corresponds to an average annual expected loss of 0.01% of objects
- 📦 Designed to sustain the loss of data in a single facility

# S3 Pricing has Three Dimensions

Storage			Data Transfer		Requests	
Tier	Normal	RRS	Tier	Price	Type	Price
First 1 TB/mo	\$0.125/GB	\$0.093/GB	All transfer in	Free	PUT, COPY, POST, or LIST	\$0.01 per 1,000
Next 49 TB	\$0.111/GB	\$0.083/GB	First 1 GB out	\$0.00/GB	GET and all other requests	\$0.01 per 10,000
Next 450 TB	\$0.095/GB	\$0.073/GB	<= 10 TB out	\$0.12/GB		
Next 500 TB	\$0.090/GB	\$0.063/GB	Next 40 TB out	\$0.09/GB		
Next 4000 TB	\$0.080/GB	\$0.053/GB	Next 100 TB out	\$0.07/GB		
> 5000 TB	\$0.055/GB	\$0.037/GB	> 350 TB out	\$0.05/GB		

# Access Control Lists

- Control access to bucket or to object
- No inheritance from bucket to object
- Set at create, write, or any time
- List of up to 100 grants by:
  - Owner
  - Email
  - Any AWS account
  - Anyone
- Permissions:
  - READ – Object or bucket
  - WRITE – Create, overwrite, delete objects in bucket
  - READ\_ACP – Read ACL for bucket or object
  - WRITE\_ACP – Overwrite ACL for bucket or object
  - FULL\_CONTROL – All of the above



# Bucket Policy

***Allow Jason or Mark to do anything in my S3 bucket  
when coming from the Office internal network***

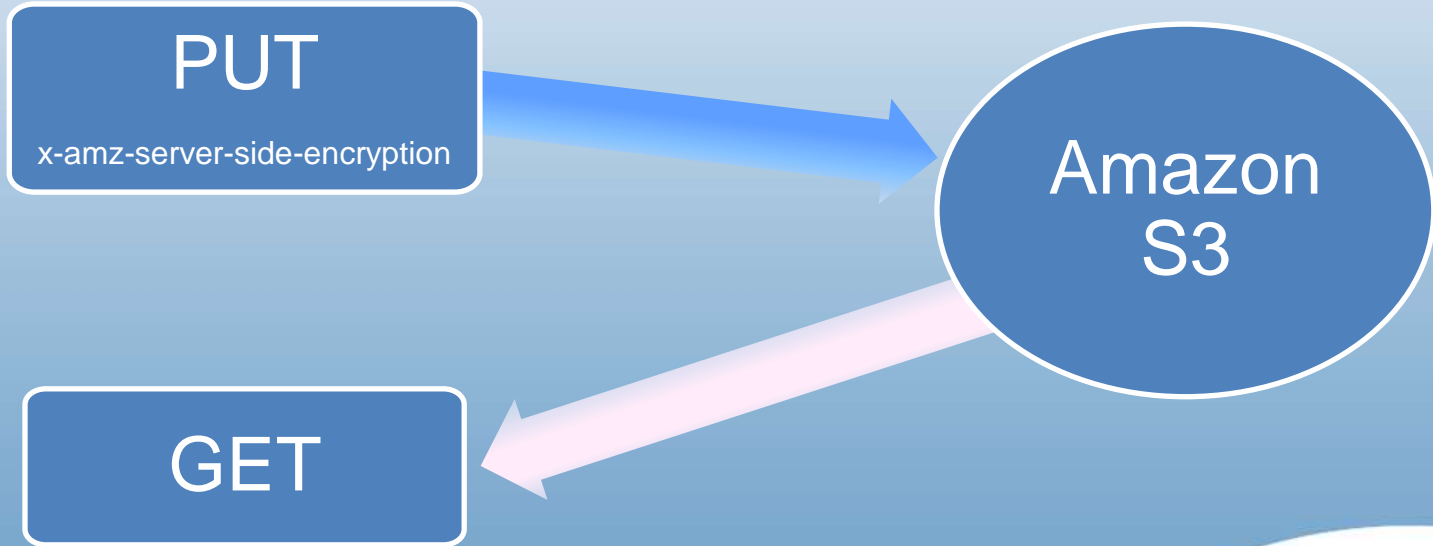
```
{"Statement": [{  
  "Effect": "Allow",  
  "Principal": {"AWS": ["4649-6425", "5243-0045"]},  
  "Action": "*",  
  "Resource": "/mybucket/*",  
  "Condition": {  
    "IpAddress": {"AWS:SourceIp": "176.13.0.0/12"}  
  }  
}]}
```

# Server Side Encryption

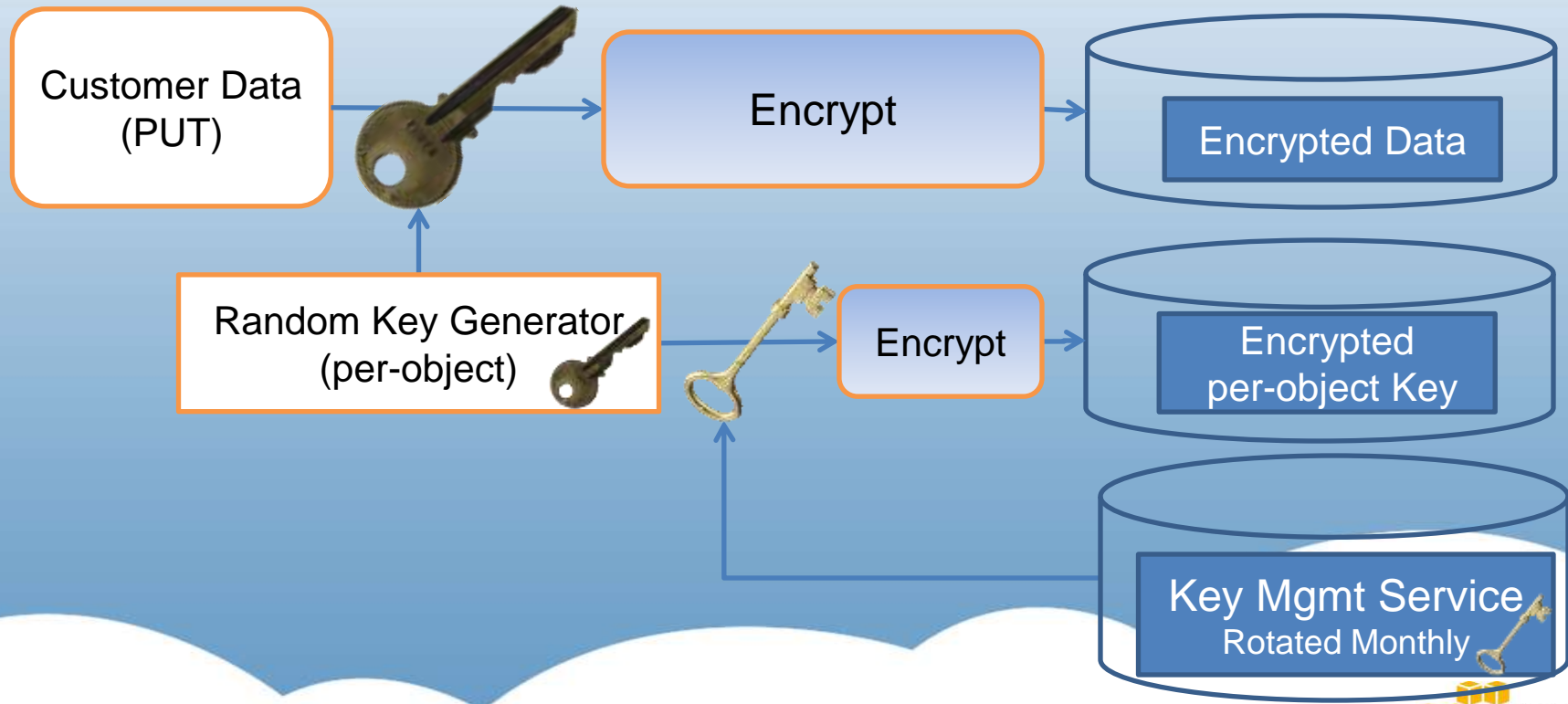
SSE automatically encrypts data at rest within Amazon S3. Customer benefits include being:

- 📦 **Simple** – Requires only an additional header in a PUT request
- 📦 **Durable** - Highly Durable Keys = Highly durable data
- 📦 **Strong** - Data encrypted using AES-256
- 📦 **Self Managed** – No burden of managing a key store
- 📦 **Secure** - Decryption requires simultaneous access to 3 components

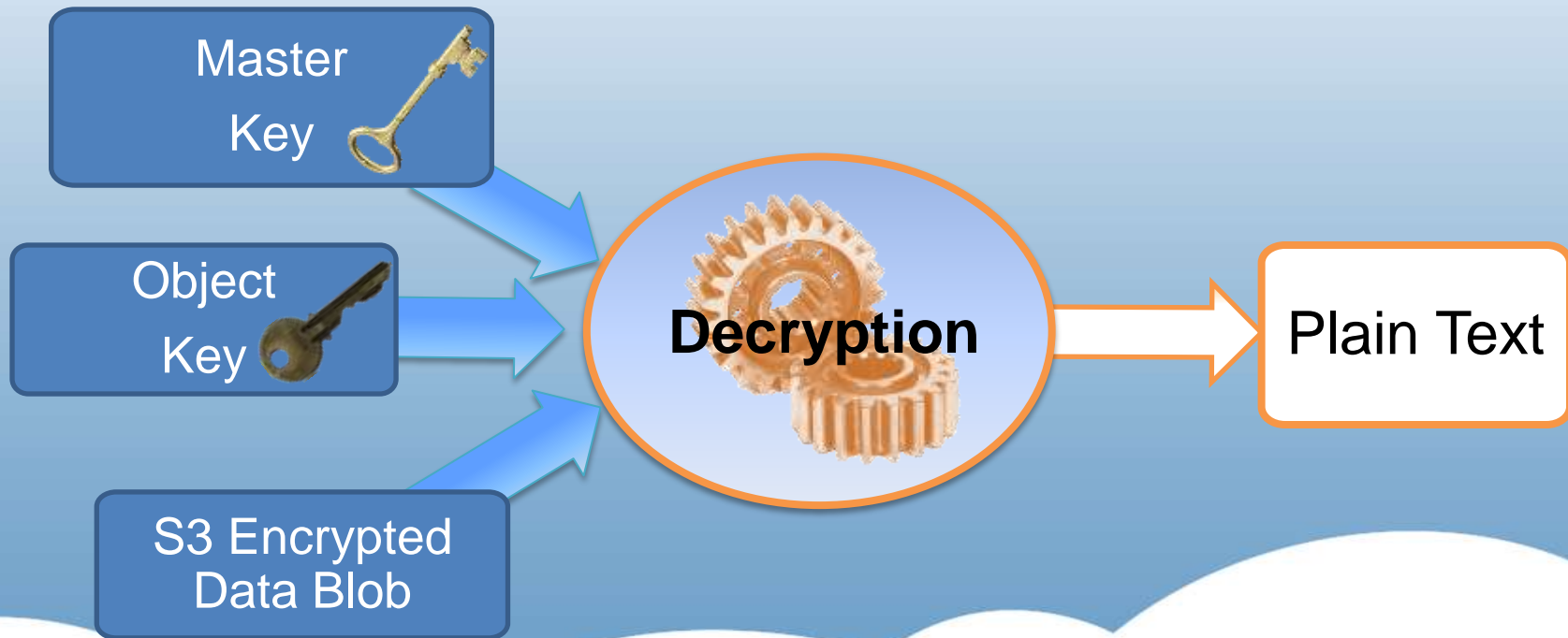
# Simple: New PUT header



# SSE High Level Design



# Decryption requires 3 separate factors





# S3 Multipart Uploads

- 📦 **Improved throughput** - upload parts in parallel
- 📦 **Quick recovery from any network issues** - Smaller part size minimizes the impact of restarting a failed upload due to a network error.
- 📦 **Pause and resume object uploads—**
  - upload object parts over time
  - Once you initiate a multipart upload there is no expiry
  - must explicitly complete or abort the multipart upload
- 📦 **Begin an upload before you know the final object size** - can upload as you are create.

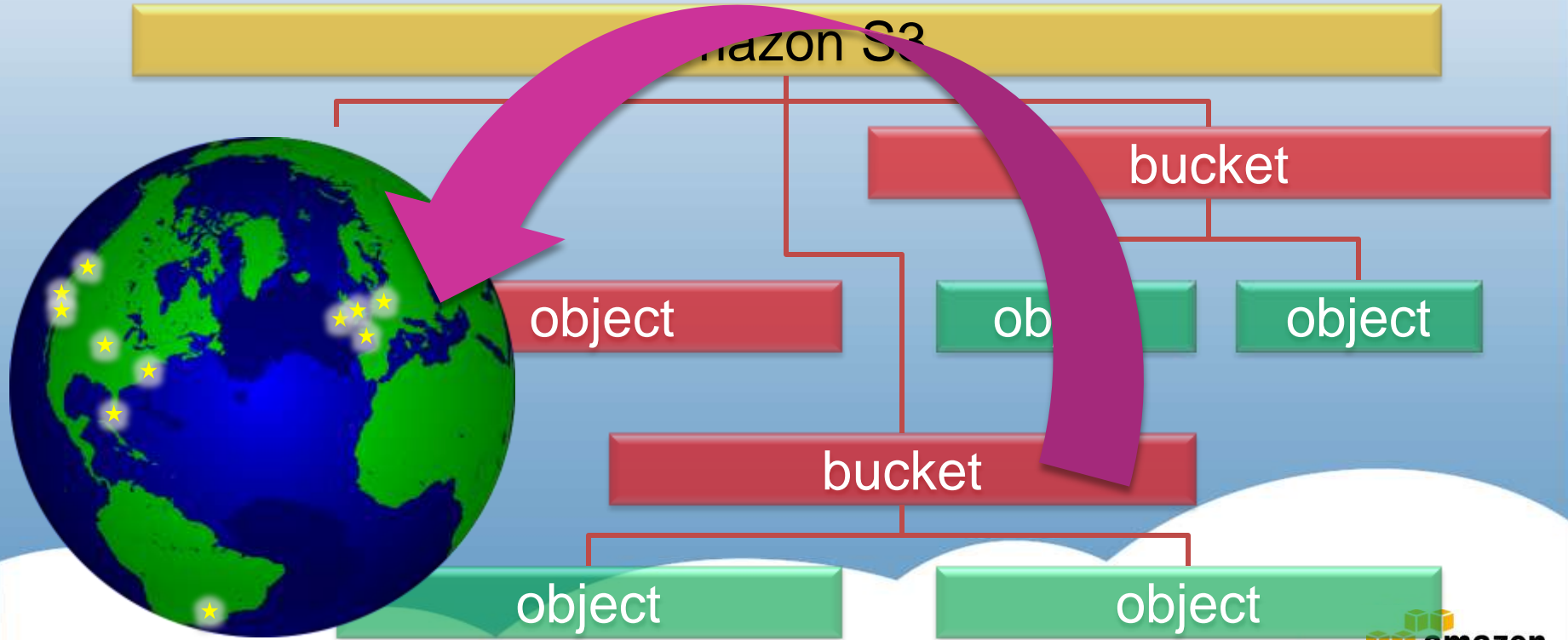
# Even More Amazon S3 (not so simple, is it?)

- Website support
- Versioning
- Browser Upload to S3
- Logging
- Requestor Pays
- Signed URLs
- Bittorrent support
- IAM
- Meta-data
- Multi-object delete

# AWS Import/Export

- ❏ Get your data into AWS faster - load it onto a portable storage device and ship it to an Amazon data center
- ❏ Faster than Internet transfer and more cost effective than upgrading your connectivity
- ❏ Use cases: data migration, offsite backup, direct data interchange, disaster recovery

# Distributions Map to Amazon CloudFront Locations

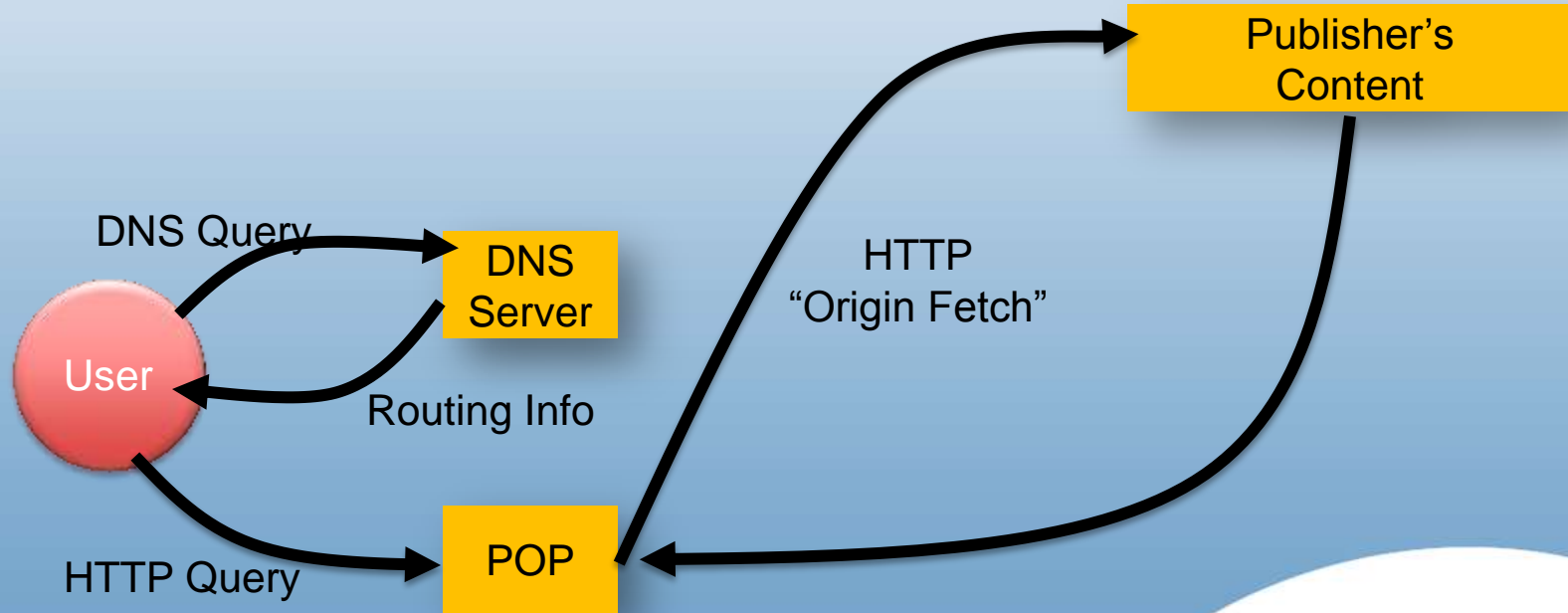


# Amazon CloudFront

- ❏ Web service for content delivery
- ❏ Edge caching of any object (S3 or server)
- ❏ Pay-as-you-go pricing
  - No up-front contracts
  - No long-term commitments
  - Volume discounts
- ❏ 33 Edge locations:
  - US (16), Europe (10), Asia (6), South America (1)
- ❏ Easy to use:
  - Create distribution
  - Issue links to objects



# How Amazon CloudFront Works



# Common S3 Use Cases

- Media Sharing
- Media/Software Distribution
- Backup (Server & PC)
- Online Storage
- Application Storage



urbanspoon

Choose a city: [Calgary](#) [Los Angeles](#) [New York](#) [Portland](#) [Seattle](#)

# Welcome to Urbanspoon Seattle

Seattle restaurants and reviews from critics, food bloggers and friends.

## Best Fine Dining

1. [Pink Door](#)
2. [Wild Ginger](#)
3. [Ray's Boathouse](#)
4. [Cafe Campagne](#)
5. [Gorgeous George's](#)
6. [Dahlia Lounge](#)
7. [Monsoon](#)
8. [Volterra](#)
9. [Restaurant Zoe](#)
10. [Metropolitan Grill](#)

[100 Best Seattle restaurants](#)

## Talk of the Town

Restaurants everyone is talking about...

## "Hard to ruin Mexican..."

[La Casita](#) - by Dogstar88[Seattle at night](#)[Blog: Restaurant Tweets](#)[Find nearby restaurants](#)Here are the most popular neighborhoods and types of food in Seattle. [See the complete list.](#)

Top Neighborhoods: Top Types of Food:

Serving over 5 Million users per month



Search

e Cities...

rez

e of the

tonight

more times

more times

more times



# European Space Agency

(\*) Source : [http://www.esa.int/esaMI/ESRIN\\_SITE/index.html](http://www.esa.int/esaMI/ESRIN_SITE/index.html)

- ❏ Amazon S3 stores and serves satellite images and data to the community
- ❏ ESRIN: center of the European Space Agency for the Earth Observation Programs (\*)
  - Generate satellite images of Earth
  - Consumers include UN agencies, European Commission, NGOs, and Governments

SmugMug

[Home](#)

[Login](#)

[Help](#)



Your photos  
and videos  
look better here.

- No ads or spam
- **Gorgeous** galleries
- Safe & secure

[Try It!](#)

[Learn more](#)

Pro Zone



Photo. Fusion. Now.

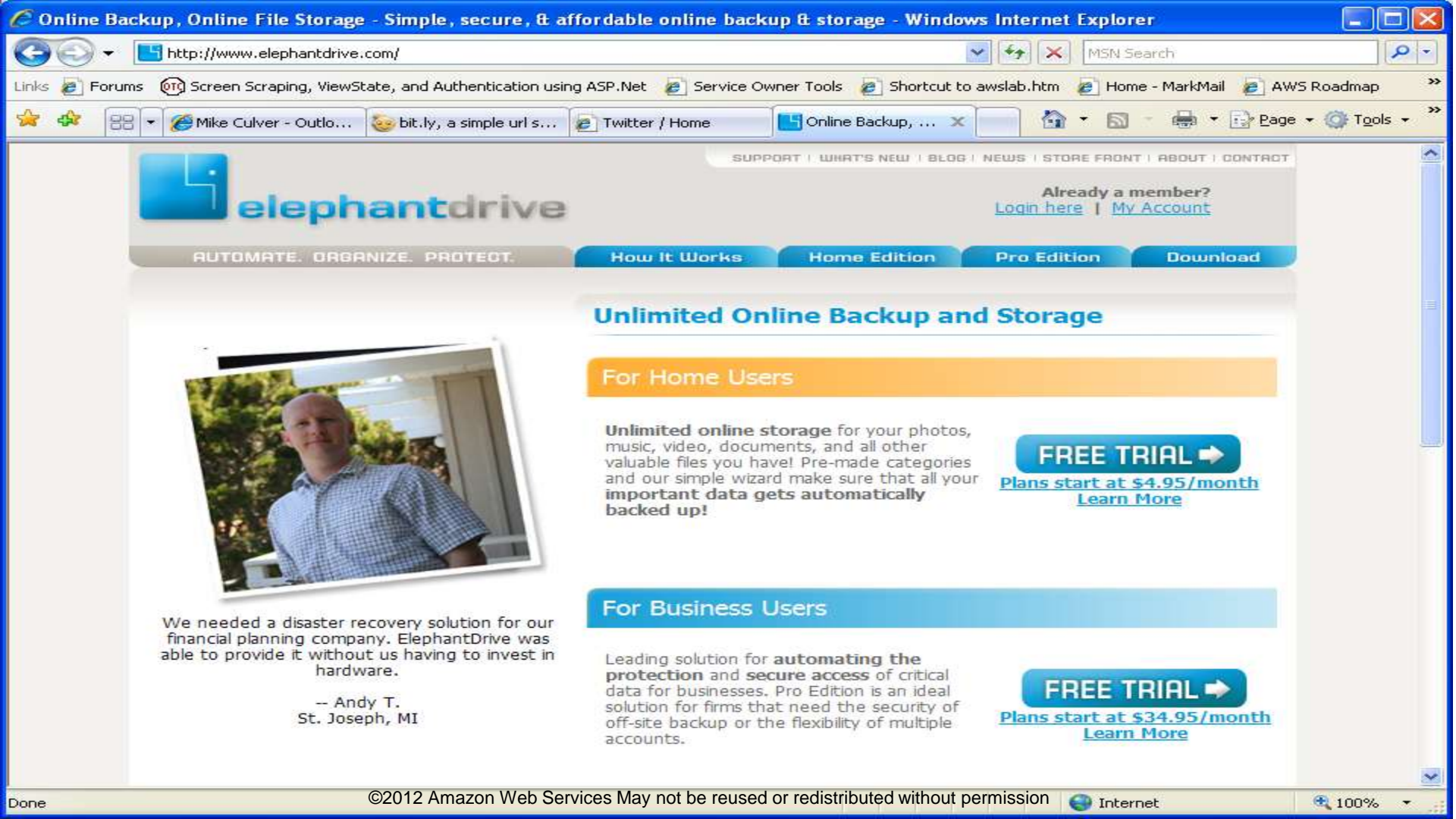


New! Pro Print Lab



Popular Photos





Already a member?  
[Login here](#) | [My Account](#)

AUTOMATE. ORGANIZE. PROTECT.

How It Works

Home Edition

Pro Edition

Download

## Unlimited Online Backup and Storage

### For Home Users

**Unlimited online storage** for your photos, music, video, documents, and all other valuable files you have! Pre-made categories and our simple wizard make sure that all your **important data gets automatically backed up!**

**FREE TRIAL** →

**Plans start at \$4.95/month**  
[Learn More](#)



We needed a disaster recovery solution for our financial planning company. ElephantDrive was able to provide it without us having to invest in hardware.

— Andy T.  
St. Joseph, MI

### For Business Users

Leading solution for **automating the protection and secure access** of critical data for businesses. Pro Edition is an ideal solution for firms that need the security of off-site backup or the flexibility of multiple accounts.

**FREE TRIAL** →

**Plans start at \$34.95/month**  
[Learn More](#)

Secure Backup - Oracle Database - Mozilla Firefox

File Edit View History Delicious Bookmarks Tools Help

⏮ ⏪ ⏩ ⏭

🏠 📁 📌

🔍

http://www.oracle.com/database/secure-backup.html

☆

🔍 Google

Most Visited Customize Links https://sea-salmon.a... https://aws157-cons...

Recently Bookmarked Perspectives - The Co... Automounting Amazo... fast XML parsing with ... Java in the Cloud - O'... RAID 0 on EC2 EBS v...

S3 Firefox Organizer Secure Backup | Oracle Database

ORACLE®

(Sign In/Register for Account | Account Help) | Worldwide

Oracle

secure search

Oracle.com

PRODUCTS AND SERVICES | INDUSTRIES | SUPPORT | PARTNERS | COMMUNITIES | ABOUT

PRODUCTS AND SERVICES

Oracle Database

Editions

Overview

Enterprise Edition

Enterprise Options

Real Application Clusters

Real Application Testing

Active Data Guard

Advanced Compression

In-Memory DB Cache

Total Recall

Manageability

Partitioning

Content Database

OLAP

Data Mining

Database Vault

Advanced Security

Label Security

Oracle Secure Backup

Integrated Data Protection for Tape Backup and Internet (Cloud) Storage

Centralized tape backup management with Oracle Secure Backup provides an integrated, easy-to-use backup solution that encrypts data to tape to safeguard against the misuse of sensitive data in the event that backup tapes are lost or stolen. The Oracle Secure Backup Cloud module delivers efficient Oracle database backup to Amazon S3 through tight integration with Oracle Recovery Manager.

A Versatile Solution with Innovative Licensing

Oracle Secure Backup with Oracle Database 11g delivers high performance network tape backups for Oracle Databases and file systems on Linux, UNIX, and Windows platforms with support for over 200 different tape devices from leading vendors. The Oracle Secure Backup Cloud module complements your existing backup strategies and can run independent of Oracle Secure Backup tape management offerings. With a low entry cost of \$3,500 per physical tape drive, Oracle Secure Backup is ideal for small and mid-sized businesses and large enterprises alike.

BENEFITS

Oracle 1-800-6...

Have Oracle call you

Global contacts

Expand All | Close All

Downloads

Oracle Secure Backup

close

Offers

News

Events

Technical Information

Brochures and Data Sheets

White Papers

Newsletters

Podcasts

Internet Seminars

©2012 Amazon Web Services May not be reused or redistributed without permission

# Amazon S3 Backup Solutions

## Commercial Packages

- DataCastle [www.datacastlecorp.com](http://www.datacastlecorp.com)
- Moonwalk
- Zmanda [www.zmanda.com](http://www.zmanda.com)
- TwinStrata [www.twinstrata.com](http://www.twinstrata.com)
- Cirtas [www.cirtas.com](http://www.cirtas.com)
- Tarmin [www.tarmin.com](http://www.tarmin.com)
- Cloudberry <http://cloudberrylab.com/?page=cloud-berry-backup>
- Cloudbuddy [www.mycloudbuddy.com](http://www.mycloudbuddy.com)

## Open Source Sync project

- S3 Sync [www.s3sync.net/wiki](http://www.s3sync.net/wiki)
- Quillen [www.sourceforge.net/projects/quillen](http://www.sourceforge.net/projects/quillen)
- S3 Tools [www.s3tools.org/s3cmd](http://www.s3tools.org/s3cmd)
- S3Dav [www.sourceforge.net/projects/s3dav](http://www.sourceforge.net/projects/s3dav)



©2012 Amazon Web Services May not be reused or  
redistributed without permission

