

# TASK

## S3 Storage Classes, EC2 Instance Purchasing Options, and EC2 Instance Types Explanation

### S3 Storage Classes

#### 1. S3 Standard

- Default storage class
  - Designed for **frequently accessed data** □ High durability: **99.999999999% (11 9's)**
  - High availability and low latency
  - Best for: websites, mobile apps, analytics, backups
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#### 2. S3 Standard-IA (Infrequent Access)

- For **infrequently accessed** but important data
  - Lower cost than Standard
  - Retrieval charges apply
  - Best for: backups, disaster recovery data
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#### 3. S3 One Zone-IA

- Stores data in a **single Availability Zone**
  - Cheaper than Standard-IA
  - Less resilient (AZ outage = data unavailable)
  - Best for: secondary backups, easily reproducible data
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#### 4. S3 Intelligent-Tiering

- **Automatic cost optimization**
  - Moves data between access tiers based on usage
  - No performance impact
  - Best for: unknown or changing access patterns
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## 5. S3 Glacier Instant Retrieval

- Very low-cost storage
- **Instant retrieval (milliseconds)**
- Best for: long-term data accessed occasionally but quickly required
- Cheaper than Standard-IA

## 6. S3 Glacier Flexible Retrieval

- Long-term archiving
  - Retrieval time: **minutes to hours**
  - Lower cost than Glacier Instant
  - Best for: backups where occasional delay is acceptable
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## 7. S3 Glacier Deep Archive

- **Cheapest** S3 storage class
  - Retrieval time: **12 to 48 hours**
  - Best for: compliance records, archival data stored for years
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## 8. S3 Reduced Redundancy Storage (Deprecated)

- Earlier used for non-critical data
  - Lower redundancy than Standard
  - **Deprecated** — not recommended for new data
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# EC2 Instance Purchasing Options

## 1. On-Demand Instances

- Pay **per hour or per second** with no long-term commitment
  - Flexible and best for short-term, unpredictable workloads
  - Expensive compared to other options
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## 2. Reserved Instances (RI)

- Commit for **1-year or 3-year**
  - Up to **75% cheaper** than On-Demand
  - Best for stable workloads running continuously
  - Types: Standard RI, Convertible RI
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## 3. Spot Instances

- Use unused EC2 capacity at **up to 90% discount**
  - Can be **terminated anytime** by AWS
  - Best for: batch processing, big data, testing, fault-tolerant workloads
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## 4. Savings Plans

- Commit to a **fixed amount of compute (per hour)** for 1 or 3 years
  - Flexible across instance size, region, OS
  - Up to **72% cheaper**
  - Types: Compute Savings Plan, EC2 Instance Savings Plan
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## 5. Dedicated Hosts

- Physical servers fully dedicated to you
- Bring-your-own-license supported
- Best for: compliance, licensing requirements

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## 6. Dedicated Instances

- Run on hardware dedicated to a single customer
- Not fully isolated like Dedicated Host, but more secure than shared hardware

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## 7. Spot Fleet

- A collection of Spot + On-Demand instances
  - Automatically finds the cheapest capacity
  - Best for large scalable workloads
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# EC2 Instance Types

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## 1. General Purpose Instances

- Balanced **CPU + Memory + Networking**
  - Best for: web servers, application servers, development environments
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## 2. Compute Optimized Instances

- Higher **CPU performance**
  - Best for: high-performance computing (HPC), batch processing, gaming servers, scientific modelling
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## 3. Memory Optimized Instances

- More **RAM** for memory-heavy workloads
  - Best for: databases, caching, in-memory processing (Redis), big data analytics
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## 4. Storage Optimized Instances

- High **IOPS** and fast local NVMe SSD
  - Best for: NoSQL databases, log processing, data warehousing
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## 5. GPU / Accelerated Computing Instances

- Equipped with **GPUs or FPGAs**
  - Best for: machine learning, AI training, deep learning, 3D rendering, video processing
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## 6. High Memory Instances

- Extremely high RAM
  - Best for: SAP HANA, very large in-memory databases
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