Amazon Elastic File System (Amazon EFS)

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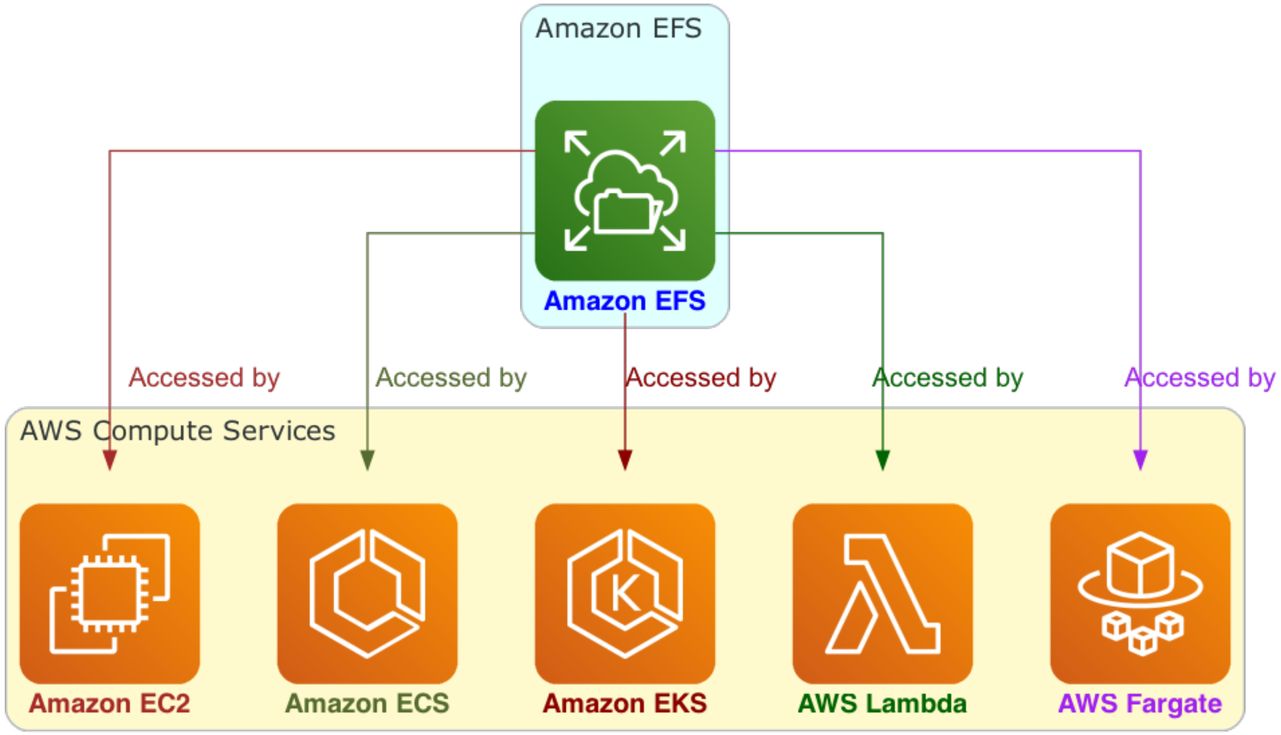
What is Amazon Elastic File System?



1. 🙌 Serverless and fully elastic file storage

🚫 No provisioning or managing storage

2. 📈 Scales on demand to petabytes

📊 Without disrupting applications

🌱 Seamless growth

3. 🎯 Automatic growth and shrinkage

➕ As files are added

➖ As files are removed

🔄 Adapts to storage requirements

4. 🌐 Simple web services interface

🔧 Quick file system creation, configuration

5. 🔧 Manages file storage infrastructure

🚫 Eliminates complexity of deploying, patching, maintaining

6. 📁 Supports NFSv4.1 and NFSv4.0 protocols

🤝 Compatibility with existing apps, tools

7. 🖥️ Accessible across AWS compute instances

💻 EC2

🚢 ECS

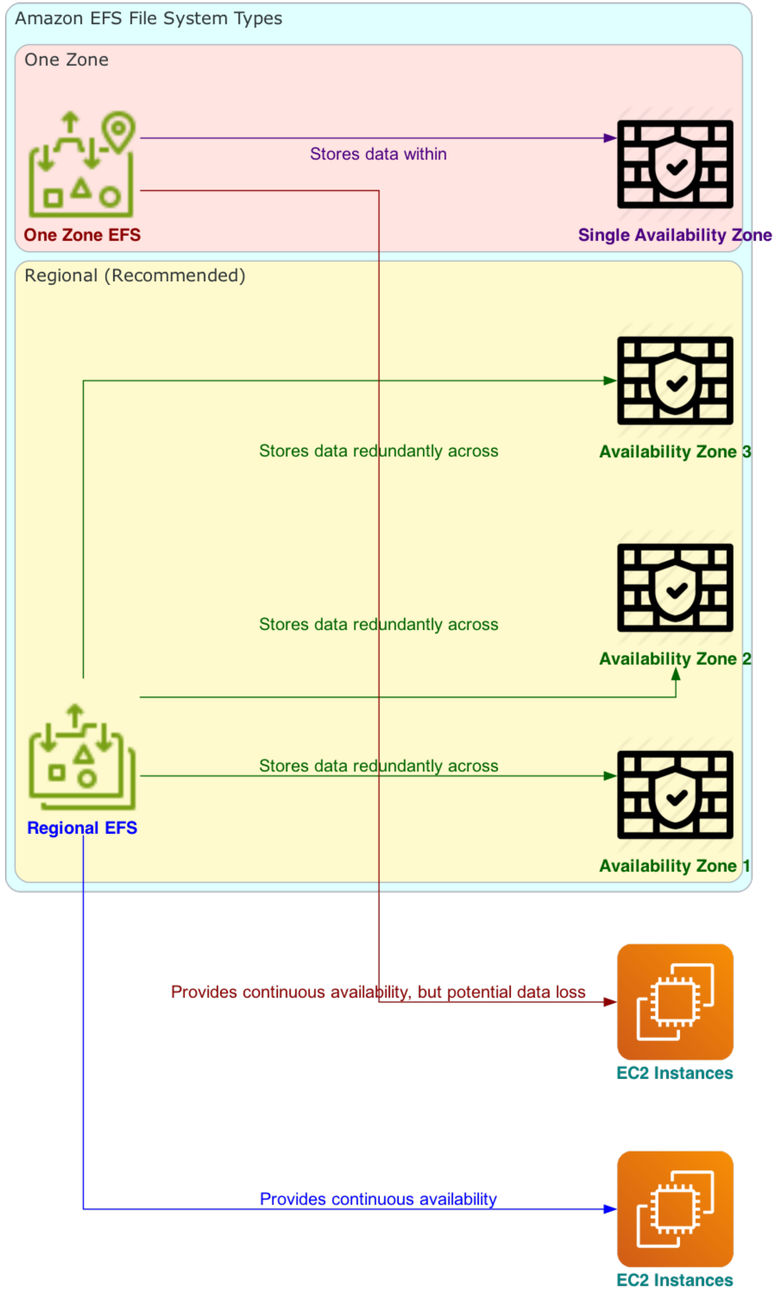
EKS

λ Lambda

📦 Fargate

🔌 Flexible integration with AWS

Amazon EFS File System Types



1. 🌐 Regional (Recommended)

🌍 Stores data redundantly across multiple AZs

🔄 Provides continuous availability

🌎 Within an AWS Region

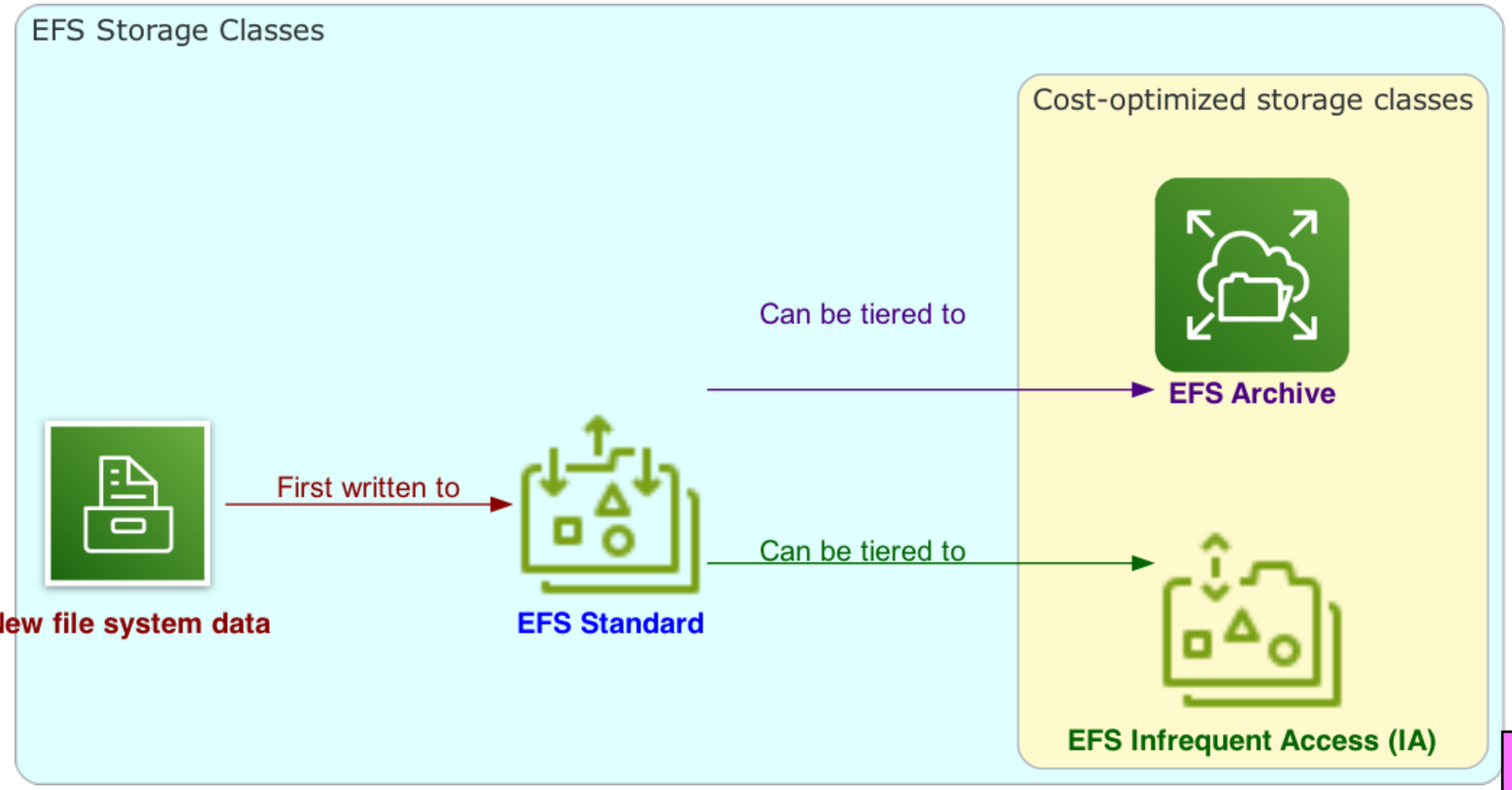
2. 🎯 One Zone

🏢 Stores data within a single AZ

⚠️ Potential data loss

🚨 If AZ fails

📦 EFS Storage Classes



1. 🌟 EFS Standard
💽 SSD storage
⏱️ Lowest latency
📝 New data first written here

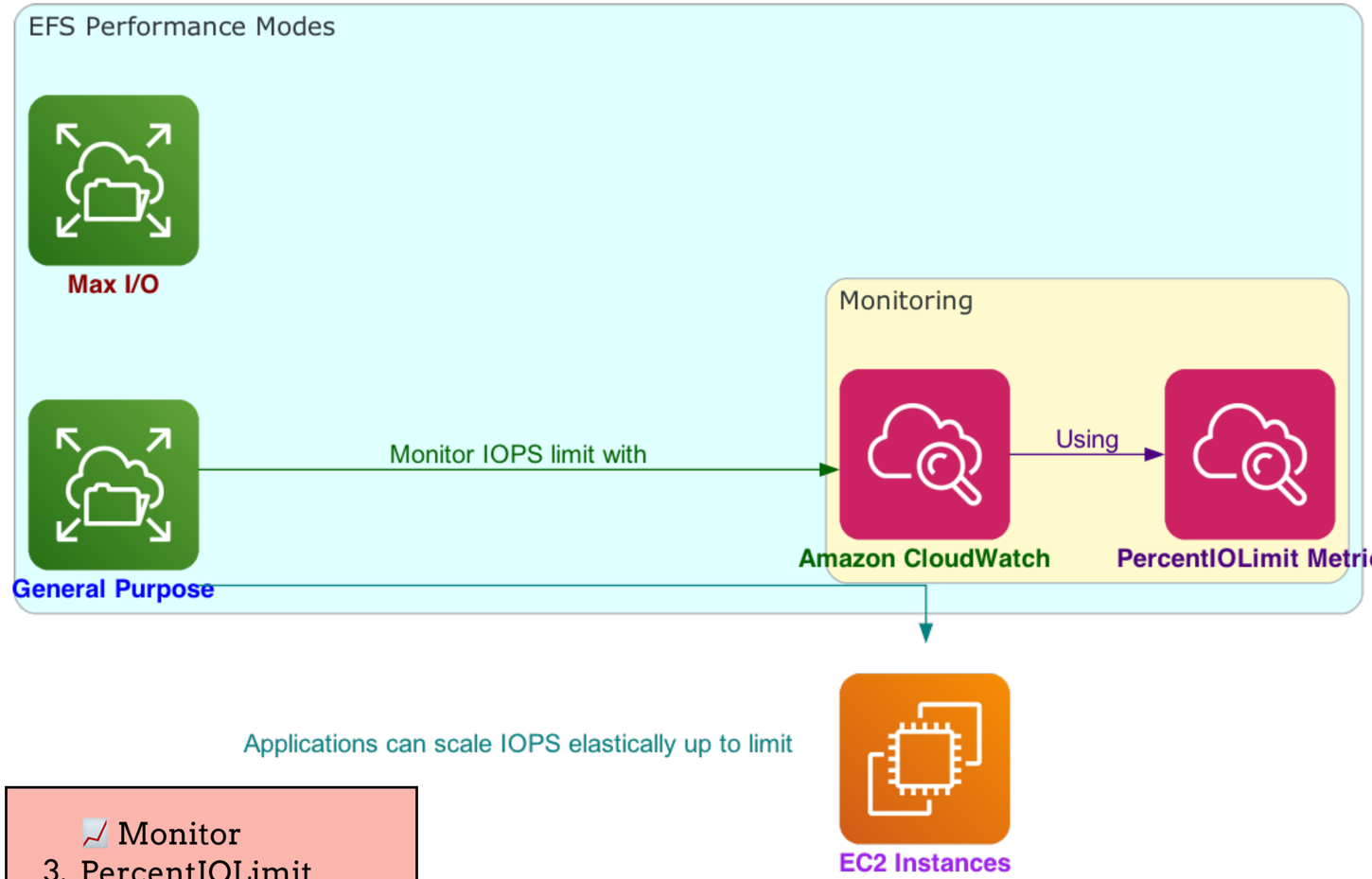
2. 💰 EFS Infrequent Access (IA)
💸 Cost-optimized
🗓️ Accessed few times per quarter

3. 🗄️ EFS Archive
💸 Cost-optimized
📅 Accessed few times per year or less
$ Lowest storage costs

4. 🔄 Tiering using lifecycle management
🌟 From Standard
💰 To IA
🗄️ And Archive
💹 Optimizes costs based on access patterns

5. ⚠️ Archive limitations
🔄 Only on EFS with Elastic throughput
🚫 No switching to Bursting or Provisioned

🚀 EFS Performance Modes



1. 🎯 General Purpose mode
⏱️ Lowest per-operation latency
🔧 Default performance mode
🎯 Used for One Zone file systems
💨 Recommended for faster performance

2. 🏎️ Max I/O mode
👴 Previous generation
🧩 For highly parallelized workloads
🐢 Can tolerate higher latencies
🚫 Not supported for One Zone or Elastic throughput

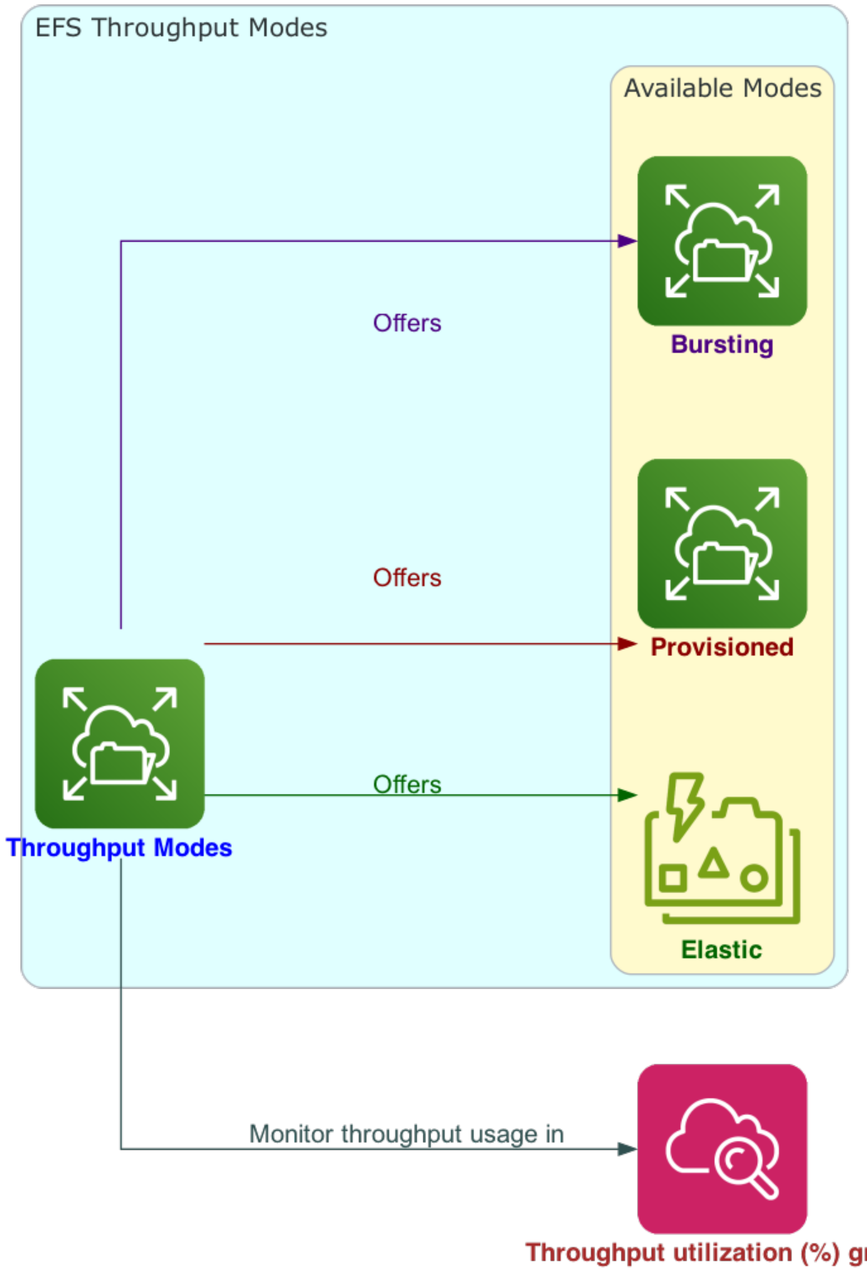
3. 📈 Monitor PercentIOLimit CloudWatch metric
🎯 For General Purpose mode
🚦 Ensures workload stays within IOPS limit

4. 🌿 Applications can scale IOPS elastically
📈 Up to the performance mode limit

5. 💰 IOPS included in throughput accounting
🚫 Not billed separately

6. 📊 Every NFS request accounted
💾 As 4KB or actual size
📏 Whichever is larger

🚀 EFS Throughput Modes



1. 🌟 Throughput mode determines available throughput

- 🗃️ In Amazon EFS

2. 🎛️ Three modes

- 🔄 Elastic
- 📈 Provisioned
- 💥 Bursting
- 🌈 Providing flexibility

3. 📖 Read throughput discounted

- 📩 Higher read than write
- 📚 Optimizing for read-heavy workloads

4. 🌍 Maximum throughput depends on AWS Region

- 🌎 Varies by region

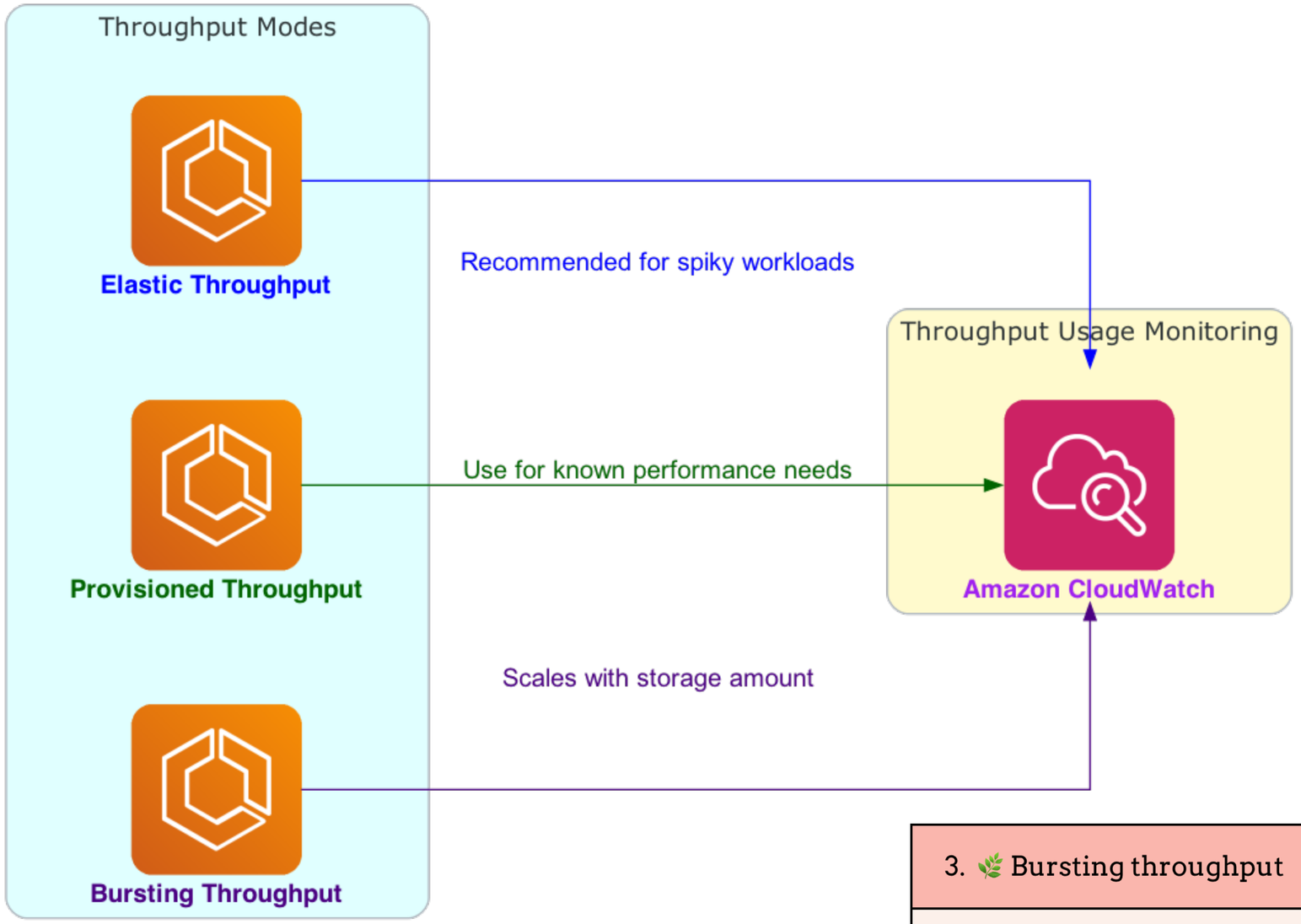
5. 💯 Combined 100% read and write throughput achievable

- 🔍 Example: 33% read + 67% write

6. 📊 Monitor throughput usage

- 📈 Throughput utilization (%) graph
- 🖥️ On File System Detail page
- 🖱️ In AWS Management Console

Choosing the Correct EFS Throughput Mode



1. 🌐 Elastic throughput (Recommended)
🌀 Spiky, unpredictable workloads
📉 Average-to-peak ratio ≤ 5%
🔮 Difficult to forecast performance

2. 📈 Provisioned throughput
📋 Known performance requirements
📈 Average-to-peak ratio > 5%

3. 🌿 Bursting throughput
📏 Scales with storage amount

4. 🚦 If throughput-constrained with Bursting
🌐 Use Elastic instead
📈 Or use Provisioned instead
⚠️ Example: > 80% permitted throughput used
💸 Or all burst credits used

5. 📊 Use CloudWatch to determine average-to-peak ratio
📏 Compare MeteredIOBytes to PermittedThroughput

How Amazon EFS works

1. 🙌 Simple, serverless, elastic file system

2. 🖥️ Create file system, mount on EC2, read/write data

3. ☁️ Mount in VPC via NFSv4

4. 🌐 Concurrent access from multiple NFS clients

📈 Applications can scale beyond single connection

5. 🌍 Access across AZs in same region

👥 Many users can share common data source

6. 🎯 Create mount targets in VPC for access

🌐 One per AZ for Regional EFS

🎯 Single mount target for One Zone EFS

7. 🔌 Mount target provides NFSv4 endpoint IP

8. 🔍 Mount using DNS name

🗺️ Resolves to mount target IP in same AZ

9. 🔄 Mount targets are highly available

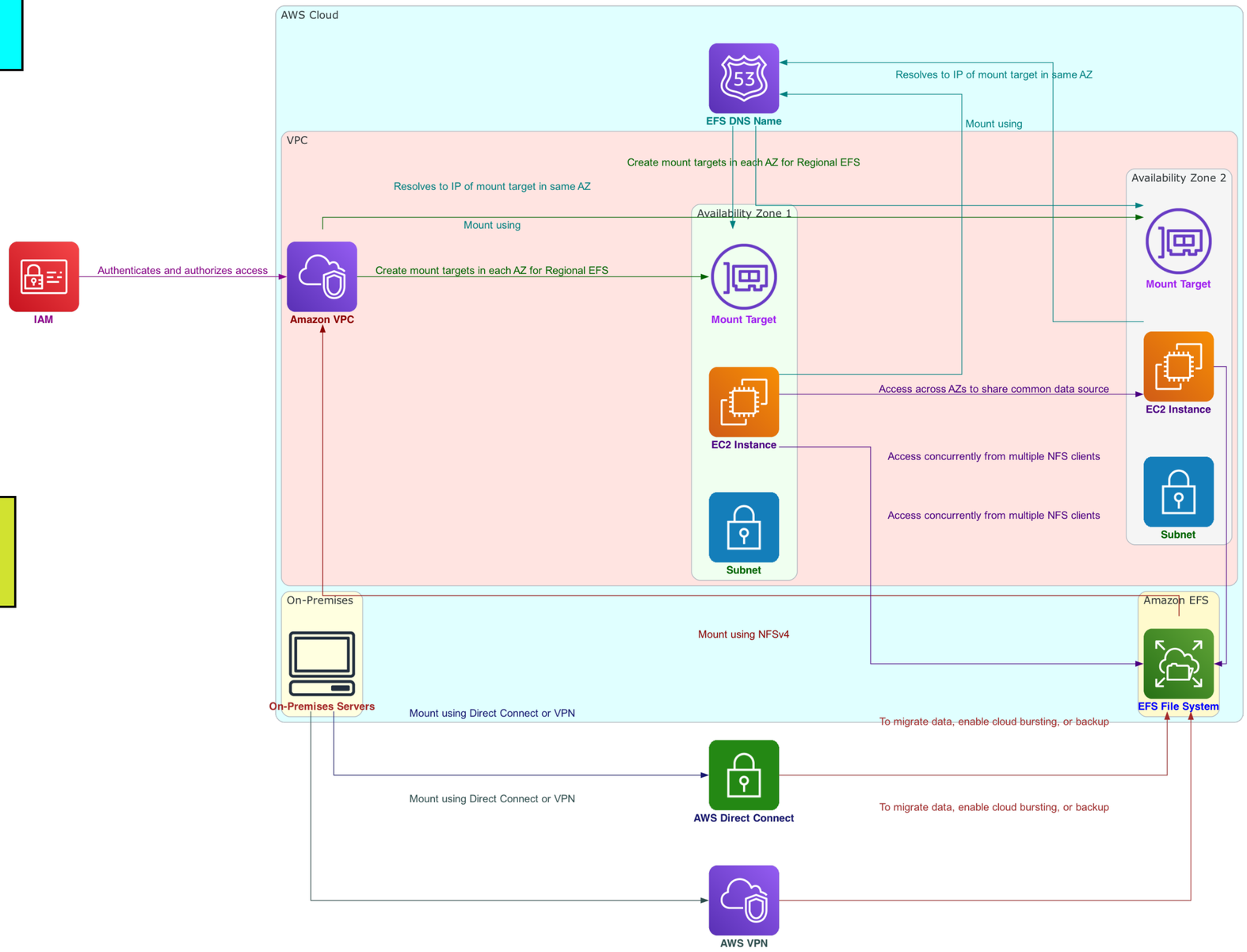
🗺️ IP addresses and DNS are static but redundant

10. 📂 Use like any POSIX-compliant file system

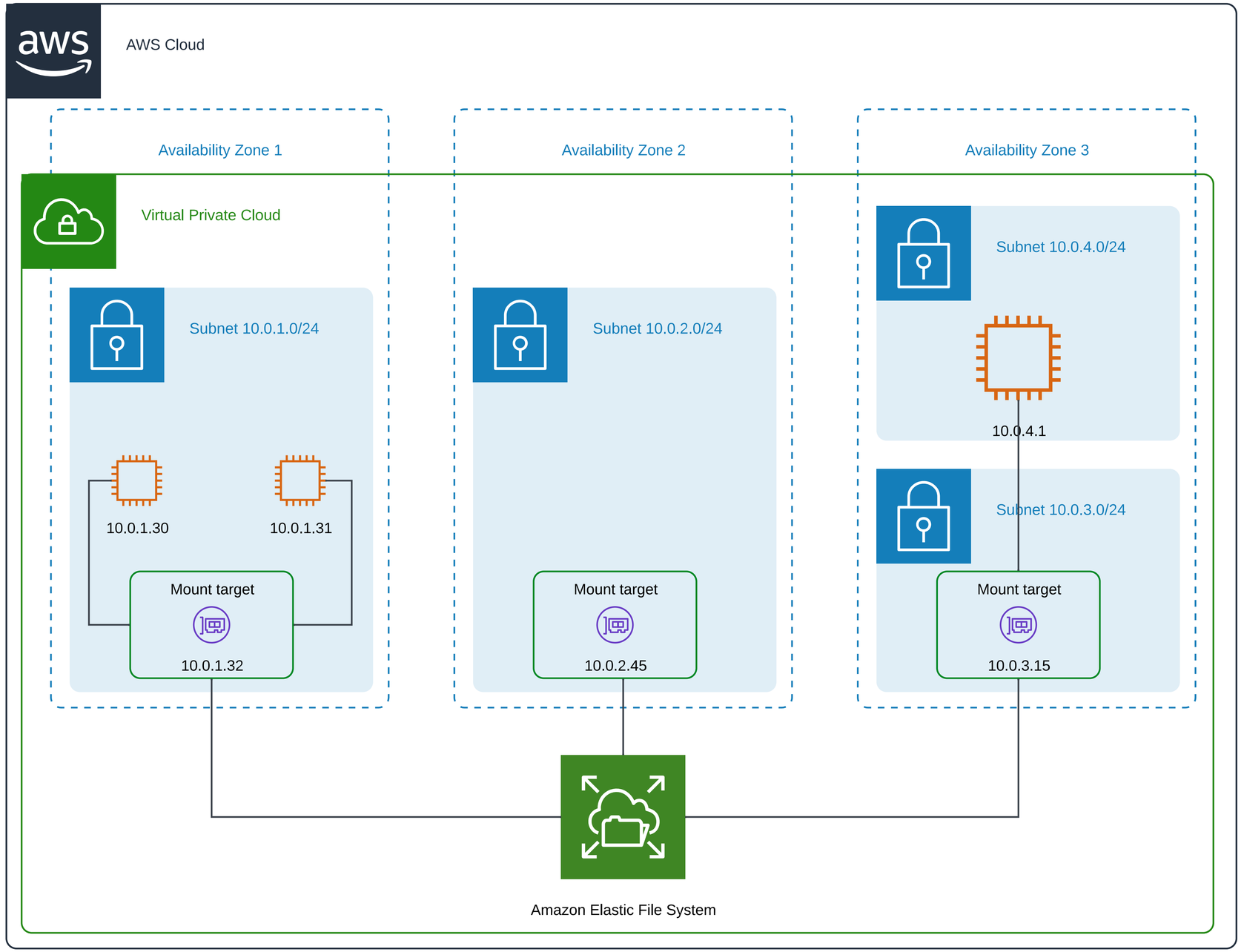
11. 🏢 Mount on on-premises servers

🌉 Using AWS Direct Connect or VPN

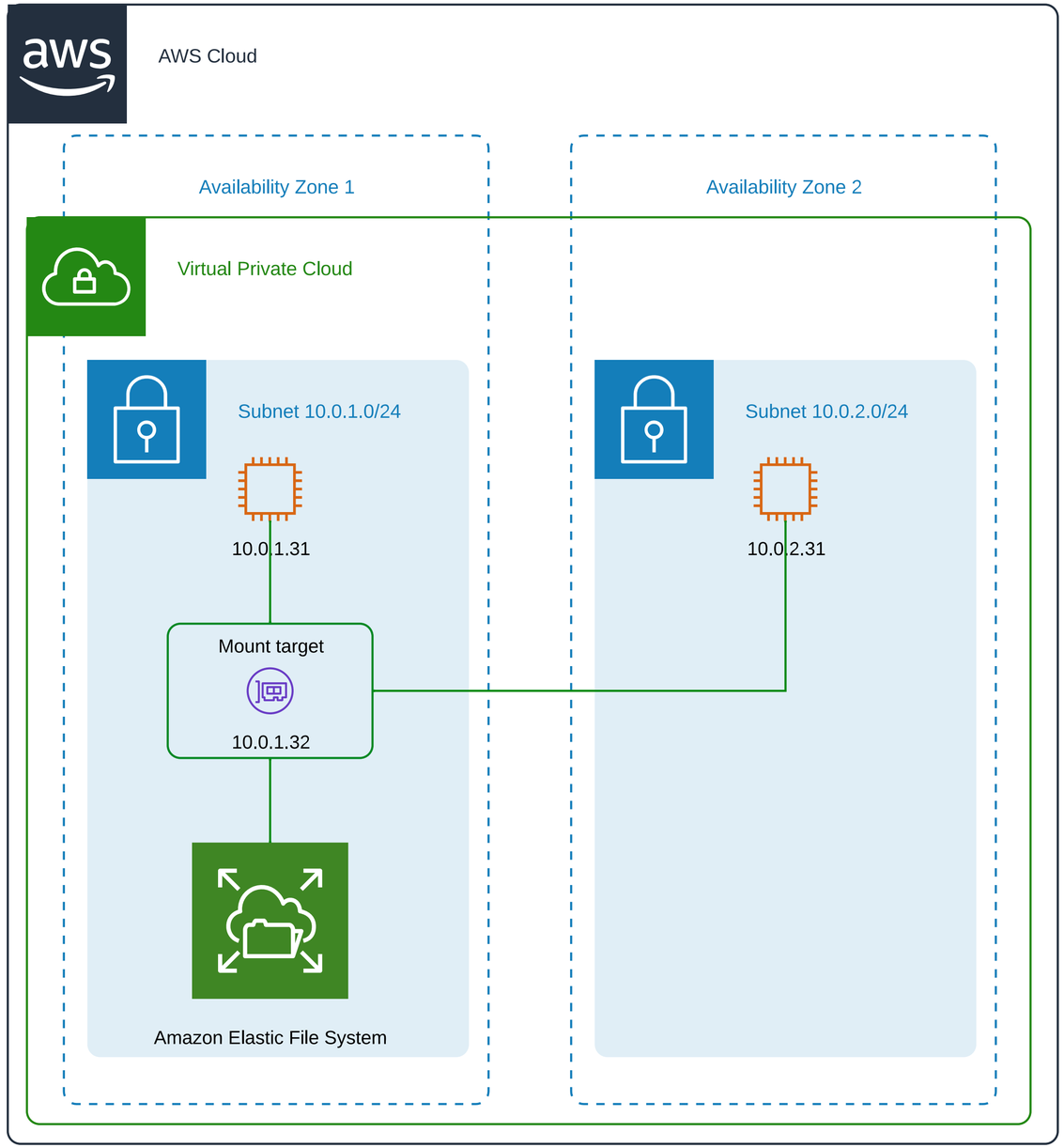
📤 To migrate data, enable cloud bursting, backup



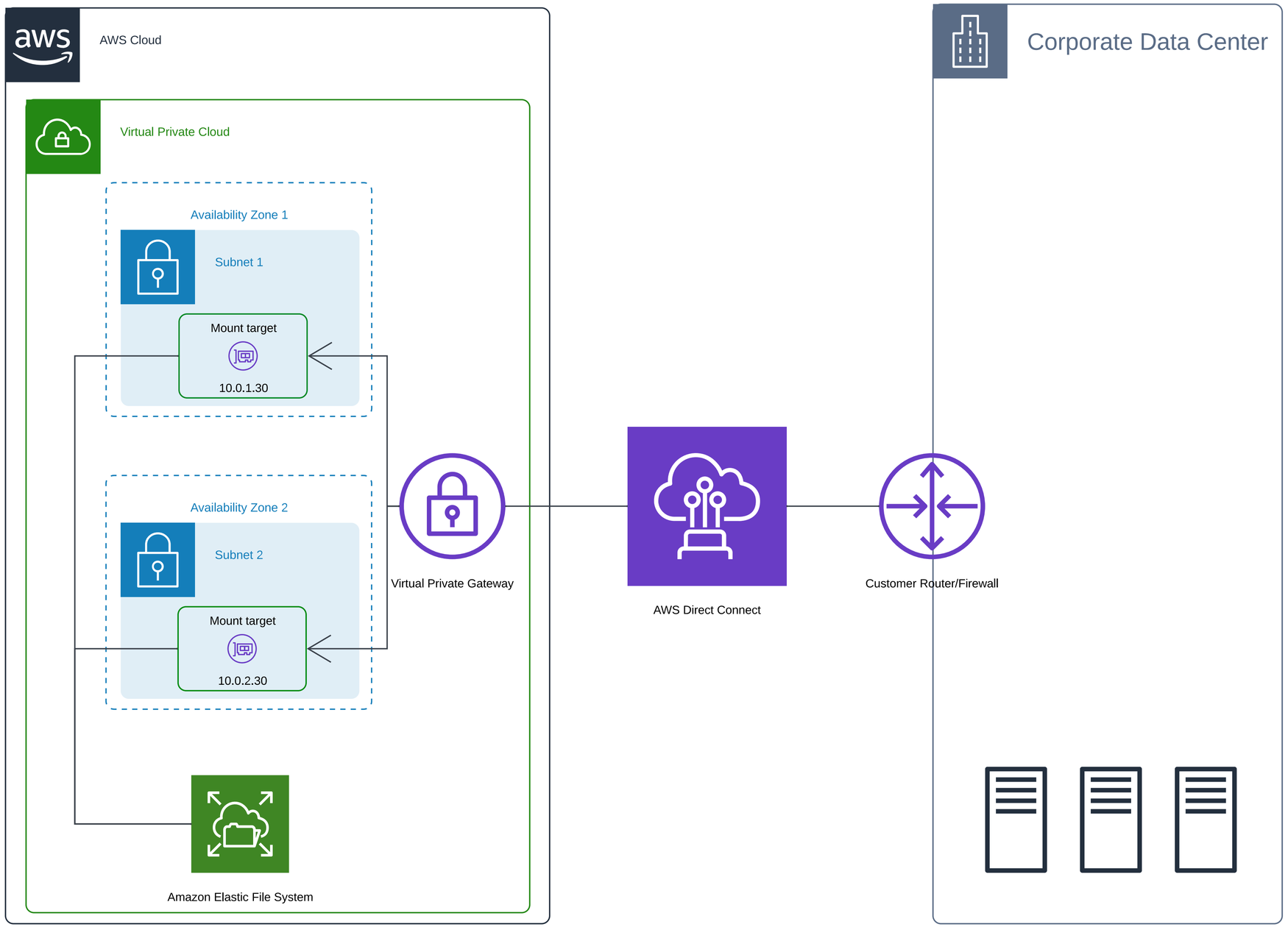
How Amazon EFS works with Amazon EC2



Amazon EFS One Zone file systems



How Amazon EFS works with AWS Direct Connect and AWS Managed VPN



Thanks for Watching