AWS Certified Solutions Architect - Associate Cheat Sheet

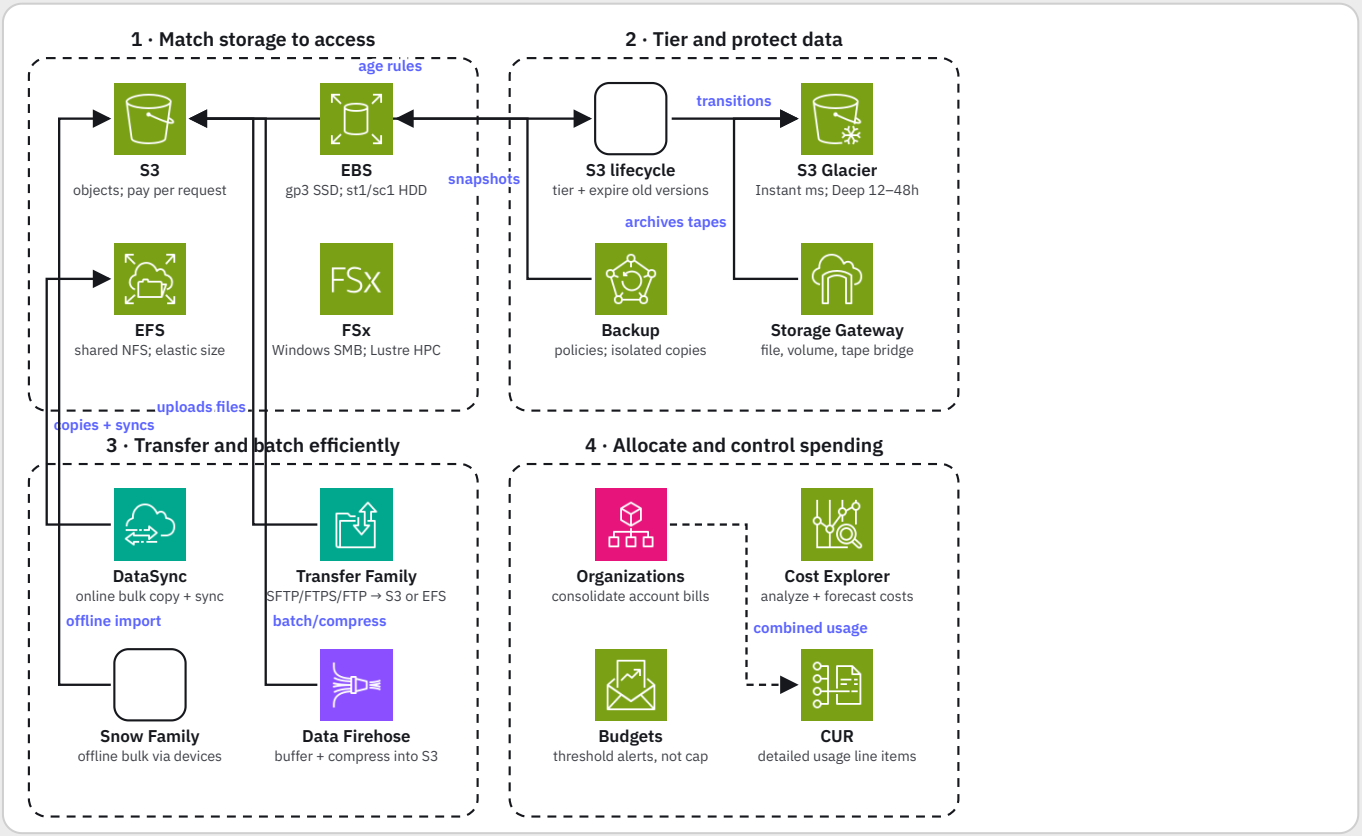
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DOMAIN 4 · DESIGN COST-OPTIMIZED ARCHITECTURES · 20% OF THE EXAM · TASK STATEMENT 4.1

Design cost-optimized storage solutions

Match, tier, transfer, control



1 Match storage to access

Access pattern selects storage: EBS SSD for random I/O, HDD for sequential throughput; EFS for shared NFS; FSx for specialized file systems. Size gp3 capacity, IOPS, and throughput independently.

2 Tier and protect data

Retention + retrieval SLA select archive tiers. Lifecycle transitions and expiry are automatic; archive restores are not. Backup policies set retention; cross-account copies isolate backups. Restore tests verify recovery.

3 Transfer and batch efficiently

Transfer deadline favors DataSync for online bulk sync or Snow for offline bulk where available. Transfer Family preserves file-transfer protocols. Compare transfer/service fees; batching and compression reduce request/storage costs.

4 Allocate and control spending

Activate cost allocation tags for cost-center reporting. Organizations consolidates billing, not permissions. Cost Explorer analyzes trends; Budgets alerts on thresholds; CUR supports granular cost analysis.

Exam traps

- S3 **Requester Pays** shifts request and download charges to the requester, not storage charges; requests require authentication.
- **Cheap per GB ≠ cheapest**: S3 Standard-IA has a 30-day minimum; Glacier Instant/Flexible 90 days; Deep Archive 180 days. Retrieval and small-object charges can erase savings.
- **Elastic storage ≠ automatic shrink**: EFS grows and shrinks with files; EBS needs explicit expansion. RDS storage autoscaling grows only; FSx scaling depends on file-system type.

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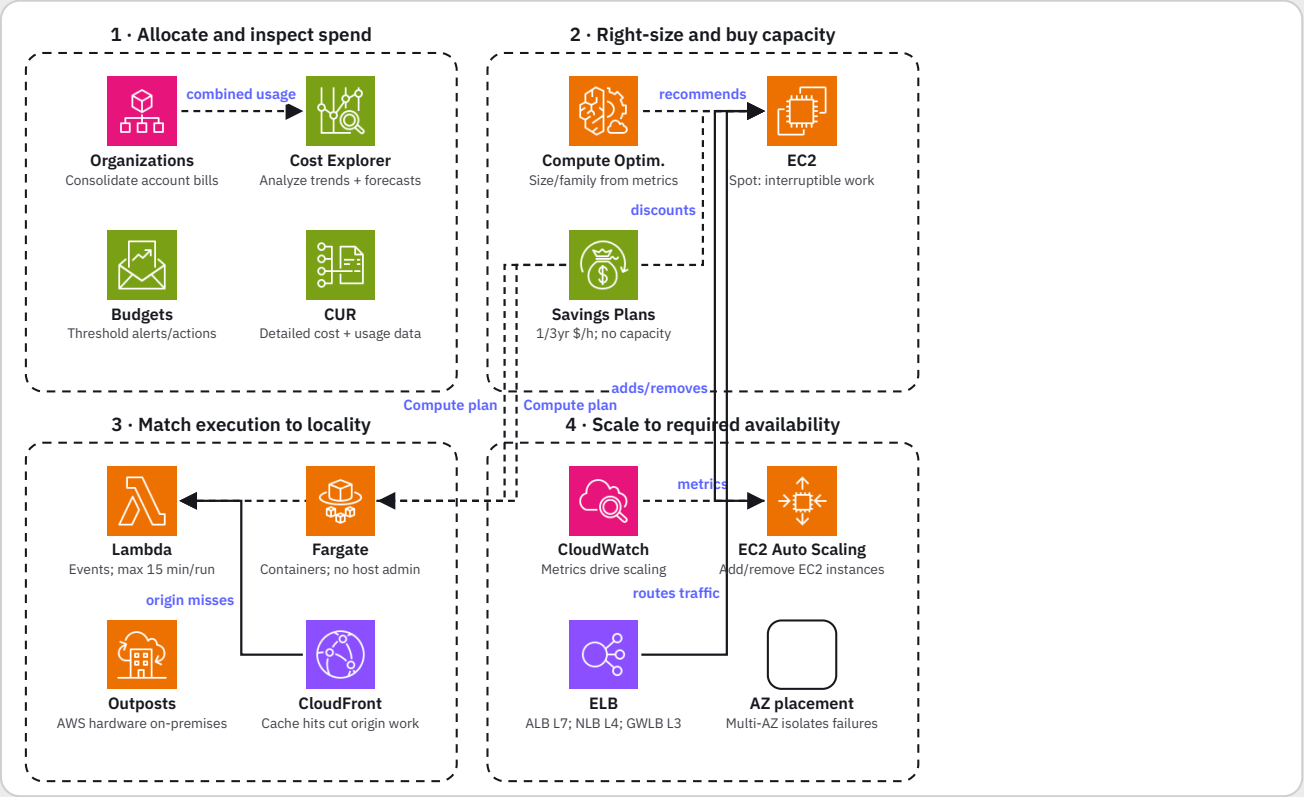
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DOMAIN 4 · DESIGN COST-OPTIMIZED ARCHITECTURES · TASK STATEMENT 4.2

Design cost-optimized compute solutions

Allocate, right-size, place, scale



1 Allocate and inspect spend

Use **activated cost allocation tags** for owner/environment reporting. Organizations combines account bills; Explorer analyzes trends; CUR supports detailed custom analysis. Budgets is not a hard spending cap.

2 Right-size and buy capacity

Commit the **measured baseline**; use On-Demand for uncertain demand and Spot for retryable jobs. Match compute-/memory-optimized families to bottlenecks; validate Arm compatibility. Recommendations do not resize EC2.

3 Match execution to locality

Choose **execution needs**: Lambda for short event tasks, Fargate for containers, EC2 for host control. Outposts meets on-premises locality needs; include hardware and operations in TCO. Edge caching reduces origin compute.

4 Scale to required availability

Match **SLOs**: spread production across AZs; schedule non-production shutdowns. Target tracking adjusts instance count. Vertical resizing changes one host, may interrupt it, and adds no redundancy.

Exam traps

- **Discount is not capacity**: Savings Plans do not reserve capacity. Regional Reserved Instances provide discounts only; zonal Reserved Instances also reserve capacity in their specified AZ.
- **Stopped is not free**: stopped EC2 instances incur no instance usage charges, but EBS remains billed. Hibernation saves RAM to EBS and incurs instance usage charges while entering hibernation.
- **Balancer is not a scaler**: ALB routes HTTP paths/hosts; NLB handles TCP/UDP and static IPs; GWLB distributes traffic to virtual appliances. Load balancing does not add compute capacity.

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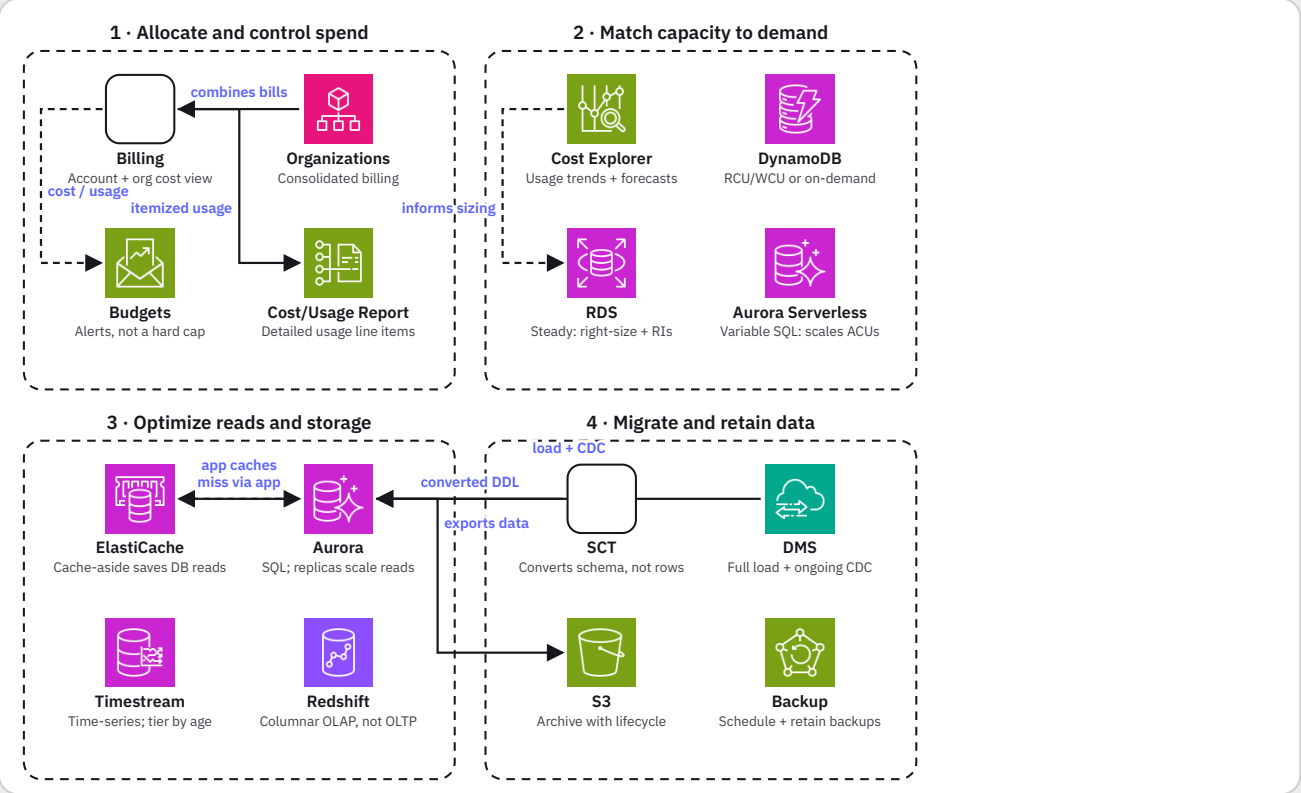
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DOMAIN 4 · DESIGN COST-OPTIMIZED ARCHITECTURES · TASK STATEMENT 4.3

Design cost-optimized database solutions

Allocate, size, cache, migrate



1 Allocate and control spend

Activate **cost allocation tags** for reporting; Organizations consolidates bills. Cost Explorer analyzes trends; the Cost and Usage Report supplies granular records. Budgets alerts do not cap spend.

2 Match capacity to demand

For **predictable demand**, right-size RDS and reserve steady usage; use provisioned DynamoDB with auto scaling. Spiky demand favors DynamoDB on-demand or Aurora Serverless; serverless is not always cheaper.

3 Optimize reads and storage

For **repeated reads**, cache-aside loads on misses; write-through updates cache on writes. Applications handle invalidation. Replicas add read capacity and cost; analytical scans favor Redshift, time series favors Timestream.

4 Migrate and retain data

For **engine changes**, convert schemas with SCT, then move data with DMS full load + CDC; same-engine moves usually skip conversion. Backup frequency follows RPO; retention and archive tiers follow recovery and access needs.

Exam traps

- **RDS Multi-AZ DB instance** standby provides failover, not read scaling. Read replicas offload reads but add cost and can return stale data because replication is asynchronous.
- For **Lambda connection storms**, pooling/proxying reuses database connections. Adding read replicas does not fix excessive connections to the writer.
- **Replication is not backup**: deletions can propagate. Backup frequency limits recoverable data loss; retention controls recovery history. DynamoDB TTL deletes expired items, not backups.

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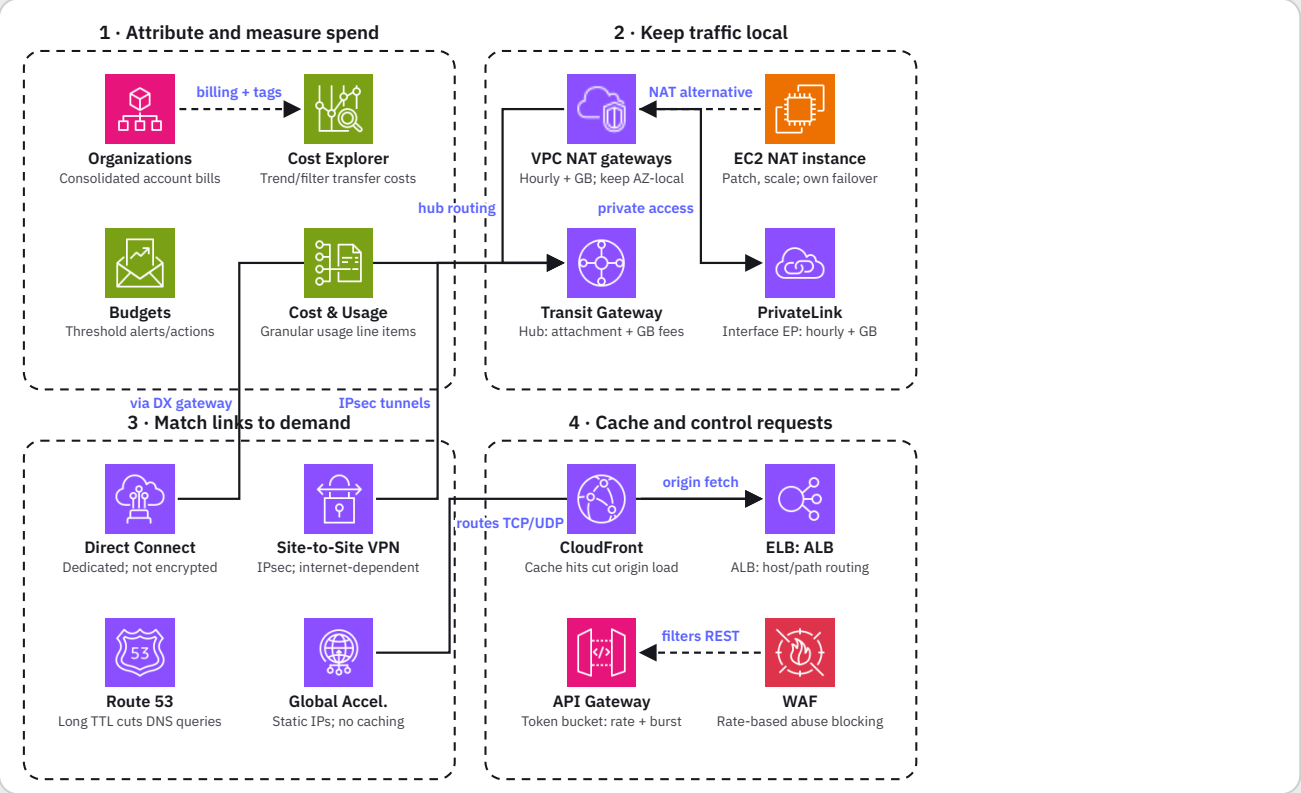
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DOMAIN 4 · DESIGN COST-OPTIMIZED ARCHITECTURES · TASK STATEMENT 4.4

Design cost-optimized network architectures

Measure, localize, connect, cache



1 Attribute and measure spend

Activated cost tags enable allocation; tagging alone does not. Explorer finds trends, Budgets alerts or runs configured actions, and Cost and Usage Report gives detail. CloudWatch traffic metrics support rightsizing.

2 Keep traffic local

One NAT saves hourly cost; **per-AZ NAT** avoids cross-AZ paths and AZ dependency. Small VPC sets favor nontransitive peering; Transit Gateway buys transitive scale. The longest matching prefix selects the route.

3 Match links to demand

VPN suits low/variable demand; Direct Connect suits sustained traffic after port, circuit and transfer costs. Transit Gateway VPN ECMP raises aggregate throughput, not one flow's speed. Client VPN serves remote users.

4 Cache and control requests

Cacheable global traffic favors CloudFront; tune TTL for freshness. Global Accelerator improves TCP/UDP paths without caching. Sharing an ALB through host/path rules can reduce hourly costs; LCU charges still apply.

Exam traps

- **S3 gateway endpoints** have no endpoint charge and avoid NAT processing for S3 traffic. Interface endpoints incur hourly and data-processing charges; private connectivity is not automatically free.
- **Budgets is not a spending cap.** API Gateway throttling and WAF rate rules are best-effort request controls, not guaranteed cost ceilings; throttling rejects requests rather than queuing traffic.
- **Long DNS TTL** reduces queries but can delay client-observed failover; Route 53 is not a traffic proxy. Cross-AZ and cross-Region transfers can add charges even when private IP addresses are used.

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DOMAIN 4 · DESIGN COST-OPTIMIZED ARCHITECTURES · WHAT TO REMEMBER

Concepts and services of Design Cost-Optimized Architectures

Concepts to know

Right-Sizing

Right-sizing matches capacity to measured CPU, memory, IOPS, and throughput needs. **Remove waste before committing**: select suitable resource sizes and use elasticity for variable demand without violating performance or availability requirements.

Commitment Discounts

Commitment discounts exchange a usage or spending commitment for lower rates. **Commit to the predictable baseline**; retain flexible capacity for peaks. Interruption tolerance, not predictability alone, determines whether Spot is suitable.

Storage Tiering

Storage tiering trades storage price against access costs and retrieval delay. **Match the tier to access patterns**; include request charges, retrieval charges, minimum storage durations, and object-size constraints rather than comparing storage rates alone.

Core services



Amazon S3

Choose Standard for frequent access, **Intelligent-Tiering for unknown or changing access**, and Glacier classes for archives; retrieval latency and minimum storage durations constrain savings.



Amazon EC2

Use **Spot for interruption-tolerant work**, Savings Plans or Reserved Instances for predictable usage, and On-Demand for short or uncertain demand; right-size and stop idle nonproduction instances.



Amazon RDS

Use **Reserved Instances for steady usage** and right-size instances and retention. Single-AZ costs less when availability requirements permit; read replicas add capacity and cost for read scaling.

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