

Cloud Economics and Billing

PRICING DRIVERS · PAY-AS-YOU-GO · RESERVED INSTANCES · TCO · ORGANIZATIONS · BILLING TOOLS · SUPPORT PLANS

STUDY & REVIEW

01 MUST KNOW

if you remember five things, remember these

- 01 Three cost drivers: compute** (per hour or per second — per-second for Linux; varies by instance type), **storage** (typically per GB), and **data transfer OUT** (per GB, aggregated across services). Inbound and same-Region service-to-service transfer: **no charge** (some exceptions).
- 02 Pricing philosophy:** pay for what you use · pay **less** when you reserve · pay **less** by using more · pay **even less** as AWS grows. Start or stop anytime; **no long-term contracts**.
- 03 Reserved Instances (EC2, RDS)** save **up to 75%** vs. equivalent on-demand. Discount order: **AURI > PURI > NURI** — the more upfront, the bigger the discount.
- 04 TCO** = financial estimate of **direct and indirect** costs (server, storage, network, IT labor) comparing on-premises vs. AWS. Deck example: 3-year on-prem **\$167,422** vs. AWS **\$7,509** — **96%** savings.
- 05 Consolidated billing** (AWS Organizations, free): **one bill** for all accounts, per-account charge tracking, **volume discounts from combined usage**. SCPs can restrict member accounts — even their root users; IAM policies never restrict root.

02 KEY TERMS

TERM	DEFINITION
Data transfer out	Outbound transfer aggregated across services, per GB; billed as “AWS Data Transfer Out”
Reserved Instance (RI)	Reserved capacity (EC2, RDS) — up to 75% cheaper than on-demand
AURI / PURI / NURI	All / Partial / No Upfront RI options; more upfront = larger discount
Tiered pricing	Volume discounts — the more you use (S3, EBS, EFS), the less per GB
AWS Free Tier	Free hands-on tier for new customers for 1 year (e.g. EC2 T2 micro)
Total Cost of Ownership	Estimate of a system's direct and indirect costs; basis of on-prem vs. cloud comparisons
Soft benefits	Hard-to-quantify value: developer productivity, customer satisfaction, agility, global reach
Organizational unit (OU)	Container for accounts under the org root; attached policies flow down; nests ≤5 levels
SCP (service control policy)	Org-level allow/deny of services per account/OU — binds all identities, incl. member root
Consolidated billing	One bill for many accounts + per-account tracking + combined-usage volume discounts
Technical Account Manager	Designated primary contact for proactive guidance — Enterprise Support only
AWS Trusted Advisor	Online tool that checks for cost-reduction, performance, and fault-tolerance opportunities

03 WHAT DRIVES THE BILL

estimate usage per characteristic, map to posted prices

DRIVER	HOW IT'S CHARGED	REMEMBER
Compute	Per hour or per second (per-second: Linux)	Rate varies by instance type
Storage	Typically per GB	Tiered — more use, lower per-GB
Data transfer OUT	Per GB, aggregated across services	“AWS Data Transfer Out”; tiered
Data transfer IN	No charge (some exceptions)	Same-Region service-to-service also free

04 TCO: ON-PREMISES VS. CLOUD

ON-PREMISES	AWS CLOUD
<i>capital expense · long planning cycles</i>	<i>flexibility · agility · consumption-based</i>
— Fixed costs: facilities, hardware, licenses, maintenance staff — Scaling up: expensive, slow · scaling down does not cut fixed costs — Buy, build, manage, refresh over time — 3-yr example total: \$167,422	— Provider builds and maintains facilities, hardware, staff — Pay for what is used; scaling either way is simple — Costs easy to estimate — they track service use — 3-yr example total: \$7,509 (96% less)

05 AWS ORGANIZATIONS

free account-management service

ASPECT	WHAT TO KNOW
Structure	Root → OUs → accounts; a policy attached to a node flows down ; OU has one parent; account lives in exactly one OU
SCPs	Allow/deny AWS services per account or OU; affect all users, groups, roles — including member-account root
IAM policies	Apply only to users, groups, roles inside an account; can never restrict the root user
Setup order	Create organization → create OUs + place accounts → create SCPs → test restrictions
Limits	1 root · 1,000 OUs · 1,000 policies · SCP ≤5,120 bytes · nesting ≤5 levels · 20 invites/day

06 COST-MANAGEMENT TOOLS

calculator = before you build; the rest = after

TOOL	JOB	REMEMBER
Pricing Calculator	Model solutions before building	Estimate = first 12 months + upfront + monthly
Billing dashboard	Month-to-date status, top services, trend	Spend Summary · Spend by Service
AWS Bills	Past month's costs per service	By Region and linked account
Cost Explorer	Graph costs and usage over time	Free · 13 months back · 3-month forecast
AWS Budgets	Alert when actual/forecast exceeds budget	Email or Amazon SNS
Cost & Usage Report	Most comprehensive cost data	Hourly/daily line items → S3

07 SUPPORT PLANS

severity: critical · urgent · high · normal · low — response varies by plan

PLAN	DESIGNED FOR	HIGHLIGHTS
Basic	Every customer (automatic)	24/7 customer service, docs, forums · 6 core Trusted Advisor checks · Personal Health Dashboard · no case support
Developer	Testing / early development	Guidance + technical support, non-production workloads
Business	Production workloads	Key services used extensively; availability, scalability, security
Enterprise	Business/mission-critical workloads	Proactive management · launch/migration support · TAM

- × “AWS charges for inbound data transfer.” — Generally **false**. Inbound and same-Region service-to-service transfer are free (some exceptions); you pay for aggregated transfer **out**.
- × “No Upfront RIs give the biggest discount.” — Backwards. More upfront = more discount: **AURI largest**, NURI smallest.
- × “A free service means a \$0 bill.” — VPC, IAM, Elastic Beanstalk, CloudFormation, automatic scaling, OpsWorks are free, but the **resources they provision** (e.g. scaled-out EC2) are billed.
- × “TCO is just the server price.” — TCO adds **direct and indirect** costs: storage/network hardware, facilities, power, floor space, and IT labor.
- × “IAM policies can restrict the root user.” — **Never**. Only an SCP (via Organizations) restricts a member account's root user.
- × “Organizations replaces IAM.” — No. SCPs act at the account/OU level; IAM policies still govern users, groups, roles inside each account.
- × “Cost Explorer estimates a solution before you build it.” — That's the **Pricing Calculator**. Cost Explorer graphs *actual* spend and forecasts only ~3 months.
- × “Basic Support includes technical case support.” — It doesn't. Basic = customer service, forums, 6 Trusted Advisor checks, Personal Health Dashboard — **no cases**.

09 SELF-QUIZ

answers are upside-down below

- Q1** Name the three fundamental drivers of cost with AWS.
- Q2** Which two kinds of data transfer are generally free of charge?
- Q3** Which Reserved Instance payment option earns the largest discount?
- Q4** Up to what percentage can Reserved Instances save over equivalent on-demand capacity?
- Q5** How long does the AWS Free Tier last for new customers?
- Q6** Which AWS Organizations feature yields one bill and volume discounts from combined usage?
- Q7** Which policy type can restrict what a member account's root user can do?
- Q8** How far back does Cost Explorer show cost data, and how far ahead does it forecast?
- Q9** Which is the least expensive support plan that includes a Technical Account Manager?
- Q10** Sample CCP exam: which AWS service provides infrastructure security optimization recommendations?

ANSWER KEY (rotate the page)

Q1 compute, storage, data transfer out **Q2** inbound, and between services within the same Region **Q3** All Upfront (AURI) **Q4** 75 percent **Q5** 1 year **Q6** consolidated billing **Q7** a service control policy (SCP) **Q8** 13 months back; ~3 months forecast **Q9** Enterprise Support **Q10** AWS Trusted Advisor (keyword: “recommendations”)