

Managing Resource Consumption

TAGGING · TAG ENFORCEMENT · COST MANAGEMENT TOOLS · TRUSTED ADVISOR · ELIMINATING WASTE

STUDY & REVIEW

01 MUST KNOW

if you remember five things, remember these

- 01 A tag is a key-value pair:** a label you attach to an AWS resource to **identify and categorize** it. You can assign a tag only **after** the resource exists; keys and values are **case-sensitive**; you can hold up to **50 tags per resource**; and you cannot edit or delete AWS-assigned `aws:` prefix tags (they do not count toward the 50).
- 02 Enforce tags two ways:** an **IAM policy** *prevents* non-compliant creation using the **Condition** element (`aws:RequestTag/<key>, aws:TagKeys`); **AWS Config** *detects* it afterward with the **required-tags** managed rule, reporting resources that lack a required tag key/value.
- 03 The cloud cost lever: pay only for what you need, when you need it** — so turn off unused resources (dev/test, after-hours, disaster-recovery, temporary-tagged). A **stopinator** script stops/starts instances on a schedule; the serverless version is an **AWS Lambda** function triggered by an **Amazon CloudWatch Events** event — no EC2 instance required.
- 04 Four cost tools:** **AWS Budgets** sets thresholds and alerts (actual or forecast); **Cost Explorer** visualizes trends (13 months back, 3-month forecast); the **Cost and Usage Report** gives the most granular data; a **CloudWatch billing alarm** alerts on estimated charges and must be created in **us-east-1**.
- 05 Trusted Advisor optimizes:** it scans your environment against **50+ AWS best practices** in **five categories** — cost optimization, performance, security, fault tolerance, and service limits — and recommends actions with direct links. Core checks are free to all; the full set needs a **Business or Enterprise** support plan.

02 KEY TERMS

TERM	DEFINITION
Tag	A key-value pair (label) you attach to an AWS resource to identify and categorize it
Tag key / value	The two case-sensitive parts of a tag; a best practice is a consistent, standardized format
aws: prefix tag	A tag AWS assigns and reserves (for example <code>aws:createdBy</code> or the <code>aws:cloudformation:stack</code> tag); you cannot edit or delete it, and it does not count toward the 50-tag limit
Tag propagation	When a service such as Auto Scaling, AWS CloudFormation, or Elastic Beanstalk creates a resource and tags it with a reference to itself
required-tags rule	An AWS Config managed rule that checks resources for a required tag key (and optional value) and reports non-compliant ones
Resource Groups Tagging API	Programmatic tagging — tag/untag resources, search with tag-based filters, and list tag keys and values
Stopinator	A generic script or app that finds and stops (and can start) unused instances on a schedule to reduce cost
AWS Budgets	Sets custom cost/usage budgets and alerts when actual or forecast spend exceeds them
AWS Cost Explorer	Visualizes and analyzes cost and usage to spot trends; up to 13 months history and a 3-month forecast
AWS Cost and Usage Report	Generates the most granular data about AWS costs and usage for detailed analysis
CloudWatch billing alarm	Alerts when estimated charges exceed a threshold you set; must be created in us-east-1
AWS Trusted Advisor	Online tool that checks your environment against 50+ best practices in five categories and recommends actions

03 AWS COST-MANAGEMENT TOOLS

know the one-line job of each

TOOL	WHAT IT DOES	REMEMBER
AWS Budgets	Set custom cost/usage budgets; alert when you exceed or are forecast to exceed them	Monthly/quarterly/yearly · email and/or SNS
AWS Cost Explorer	Visualize and analyze cost & usage; filter/group by service, instance type, tag	13 months back · 3-month forecast · RI recommendations · .csv export
Cost and Usage Report	Generate the most granular data about your costs and usage	Line-item detail for deep analysis
CloudWatch billing alarm	Alert when estimated charges pass a threshold	Create in us-east-1 · actual charges, not forecasts
Billing Dashboard	Month-to-date status and top services by spend	Spend Summary + MTD spend by service

04 ENFORCING TAGS — TWO MECHANISMS

preventive vs. detective

IAM POLICY (PREVENTIVE) <i>blocks non-compliant creation</i> — Uses the Condition policy element — <code>aws:RequestTag/<key></code> requires a value — <code>aws:TagKeys</code> with ForAllValues limits tags — Can also block deleting or adding tags	AWS CONFIG (DETECTIVE) <i>flags what already exists</i> — Uses the required-tags managed rule — Specify the required tag key (value optional) — Evaluates on resource change or periodically — Reports non-compliant resources after the fact
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05 AWS BUDGETS ALERT PATH

how a threshold becomes a notification

01 Set a custom cost/usage **budget** (monthly, quarterly, or yearly) → **02** Actual **or forecast** spend approaches or passes the threshold → **03** The budget alert triggers → **04** Notify via **email** and/or an **Amazon SNS** topic

06 TRUSTED ADVISOR — FIVE CHECK CATEGORIES

match the goal to the category

CATEGORY	ADVICE IT GIVES
Cost optimization	Eliminate unused and idle resources; commit to reserved capacity to save money
Performance	Check service limits, use provisioned throughput, watch for overutilized instances
Security	Close gaps, enable AWS security features, and examine permissions
Fault tolerance	Boost availability and redundancy — auto scaling, health checks, Multi-AZ, backups
Service limits	Flags services whose usage exceeds 80% of a service limit

- × “You can tag a resource as part of building it, anytime.” — A tag can be assigned only **after** the resource has been created; the CLI can specify tags on EC2 instances and EBS volumes during the create call, but the tag still applies to the created resource.
- × “Tag keys and values are case-insensitive.” — They are **case-sensitive** (Environment $\neq$ environment); mismatched case fragments your cost reports, so standardize the format.
- × “The 50-tag limit includes the AWS-generated tags.” — Tags with the `aws:` prefix **do not count** against the 50-tags-per-resource limit — and you cannot edit or delete them.
- × “AWS Config prevents untagged resources from being created.” — Config is **detective**: the required-tags rule *reports* non-compliant resources. To **prevent** creation without tags, use an **IAM policy** Condition.
- × “Create the CloudWatch billing alarm in any Region.” — Billing metric data is stored only in **us-east-1** (it represents worldwide charges), so the alarm must be created there; it triggers on **actual** charges, not a month-end projection.
- × “AWS Budgets and CloudWatch billing alarms are the same thing.” — Budgets can alert on **forecast** spend and tracks by period; the CloudWatch alarm fires only when **actual** estimated charges cross the threshold.
- × “Cost Explorer gives the most detailed line-item data.” — Cost Explorer is for **trends and visualization**; the **Cost and Usage Report** is the source of the most granular data.
- × “Trusted Advisor’s full check set is free for everyone.” — Only the **core** checks are available to all accounts; the complete set of cost, performance, security, and fault-tolerance checks requires a **Business or Enterprise** support plan.

08 SELF-QUIZ

answers are upside-down below

- | | |
|---|--|
| Q1 What two components make up an AWS tag? | Q6 How far back can Cost Explorer show data, and how far ahead can it forecast? |
| Q2 What is the maximum number of tags per resource, and do <code>aws:-</code> prefix tags count toward it? | Q7 Which cost tool gives the MOST granular data about AWS costs and usage? |
| Q3 Which AWS Config managed rule checks that resources carry the tags you require? | Q8 What serverless combination implements a stopinator without any EC2 instance? |
| Q4 Which IAM policy element enforces the use of specific tags when a resource is created? | Q9 Name the five Trusted Advisor recommendation categories. |
| Q5 In which Region must a CloudWatch billing alarm be created, and why? | Q10 In the Module 10 scenario, the Support Specialist must shrink an SCP — what is the maximum size of an SCP document? |

ANSWER KEY (rotate the page)

Q1 a key and a value (a key-value pair) **Q2** 50 tags per resource; `aws:-`prefix tags do not count toward the limit **Q3** the required-tags managed rule **Q4** the Condition element (using `aws:RequestTag` and `aws:TagKeys`) **Q5** `us-east-1` (N. Virginia) — billing metric data is stored there and represents worldwide charges **Q6** up to the last 13 months of data; forecasts the next 3 months **Q7** the AWS Cost and Usage Report **Q8** an AWS Lambda function triggered by an Amazon CloudWatch Events event **Q9** cost optimization, performance, security, fault tolerance, and service limits **Q10** 5,120 bytes