

WS Well-Architected Framework terms:

Component: The code, configuration, or AWS Resources that together deliver against a requirement

Workload: A set of components that together deliver business value

Level of effort: The amount of time, effort, and complexity a task requires for implementation.

Security: Detection, Infra, Data & IAM

To detect and investigate security events: Capture and analyze events from logs and metrics to gain visibility.

Take action on security events and potential threats to help secure a workload.

To protect network + compute resources: Any workload that with some form of network connectivity, whether the internet or a private network, requires multiple layers of defense

To classify data: Criticality and sensitivity for protection and retention controls.

Protecting data: Multiple controls to:

At rest: Prevent unauthorized access or loss.

In transit: Reduce the risk of unauthorized access or loss

To prepare and recover from incidents: Log file access and changes

Security: Detection, Infra, Data & IAM (cont)

Process and launch tools to automate responses through APIs

Prepare, pre-provision tooling and create a "clean environment" via AWS CloudFormation

To incorporate and validate security properties of apps thru CI/CD lifecycles: Validate the security properties of tools and applications help to reduce the likelihood of security issues in production

Identity and access: Human Identities ~ Interact with AWS resources via a web browser, client application, or interactive command line tools

Machine Identities ~ Service applications, operational tools and workloads

The utilization of cloud technologies to protect data, systems, and assets

Performance efficiency

The ability to use computing resources efficiently to meet system requirements

Selecting best performing architecture: Multiple approaches are required for more effective performance across a workload

3 Compute options:

1 Instances Virtualized servers

Performance efficiency (cont)

Different families and sizes

Solid-state drives (SSDs) and graphics processing units (GPUs)

2 Containers A method of operating system virtualization:

AWS Fargate - serverless compute for containers or Amazon EC2

Amazon Elastic Container Service (ECS) or Amazon Elastic Kubernetes Service (EKS)- container orchestration platforms

3 Functions Abstract run environment from the code you want to apply.

Storage

The more efficient storage solution for a system varies based on:

1) The kind of access operation (block, file, or object):

Performance efficiency (cont)

1a - Object From any internet location for user-generated content, active archive, serverless computing

Divides data into separate, self-contained units that are re-stored in a flat environment, with all objects at the same level

Contain metadata: information about the file that helps with processing and usability

1b - Block Storage Often configured to decouple the data from the user's environment and spread it across multiple environments that can better serve the data

Performance efficiency (cont)

Data is split into fixed blocks of data and then stored separately with unique identifiers

1c - File Data is stored as a single piece of information inside a folder, just like you'd organize pieces of paper inside a manila folder.

Problem is, just like with your filing cabinet, that virtual drawer can only open so far. File-based storage systems must scale out by adding more systems, rather than scale up by adding more capacity.

2) Frequency of update (WORM, dynamic)

WORM - Write once, read many (WORM) model

Dynamic

Performance efficiency (cont)

3) Availability and durability constraints

Database

Forms: Relational, key-value, document, in-memory, graph, time series, and ledger

Select according to: Availability, consistency, partition tolerance, latency, durability, scalability, and query capability

Network

As the network is between all workload components, it can have great impacts, both positive and negative, on workload performance and behavior

Determine workload requirements for bandwidth, latency, jitter, and throughput



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Performance efficiency (cont)

Physical constraints, such as user or on-premises resources, determine location options

Operational excellence

Organization

Teams must have a shared understanding of your entire workload, their role in it, and shared business goals

To determine priorities: Have shared goals to set priorities for resources

How an organizational culture supports business outcomes: Provide support for team members

Preparation

Understand workloads and their expected behaviors

To understand its state: Design your workload so that it provides the information necessary across all components (for example, metrics, logs, and traces)

To reduce defects, ease remediation, and improve flow into production: Adopt approaches that improve flow of changes into production that achieve refactoring fast feedback on quality, and bug fixing

Operational excellence (cont)

Before supporting a workload: Evaluate the operational readiness of your workload, processes and procedures, and personnel to understand the operational risks

Operate

Measured by the achievement of business and customer outcomes:

After we identify metrics that will be used in calculations

To understand the health of your workload: Define, capture, and analyze workload metrics to gain visibility to workload events

To manage workload and operations events: Prepare and validate procedures for responding

Evolve

Learn, share, and continuously improve

To evolve operations: Dedicate time and resources for nearly continuous incremental improvement to evolve the effectiveness and efficiency of your operations



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