



HATCHWORKS™
ENTERPRISE SOFTWARE SERVICES

| BUSINESS GUIDE

The 5 Pillars of the AWS Well-Architected Framework

Creating a software system is a lot like constructing a building. If the foundation is not solid, structural problems can undermine the integrity and function of the building.

When architecting technology solutions on Amazon Web Services (AWS), neglecting the five pillars—that is, of operational excellence, security, reliability, performance efficiency, and cost optimization—can make it challenging to build a system that delivers on your expectations and requirements.

Rather, incorporating these pillars into your architecture helps produce stable and efficient systems. This allows you to focus on the other aspects of design, such as functional requirements.

HatchWorks' AWS Well-Architected Framework helps cloud architects build the most secure, high-performing, resilient, and efficient infrastructure possible for their applications. This framework provides a consistent approach for customers and AWS Partner Network (APN) partners to evaluate architectures, and provides guidance to implement designs that scale with your application needs over time.

This guide provides an overview of these five most important pillars of the AWS Well-Architected Framework.





Operational Excellence

The Operational Excellence pillar includes the ability to support development and run workloads effectively, gain insight into their operation, and continuously improve supporting processes and procedures to deliver business value.



Design Principles

Design principles for operational excellence in the cloud include:

- Perform operations as code
- Make frequent, small, reversible changes
- Refine operations procedures frequently
- Anticipate failure
- Learn from all operational failures

Best Practices

Operations teams need to understand their business and customer needs so they can support business outcomes. Ops creates and uses procedures to respond to operational events, and validates their effectiveness to support business needs. Ops also collects metrics that are used to measure the achievement of desired business outcomes.

Everything continues to change—including your business context, business priorities, customer needs, and more. As such, it is important to design operations to support evolution over time in response to change, and to incorporate lessons learned through their performance.

2 Security

The Security pillar includes the ability to protect data, systems, and assets to take advantage of cloud technologies to improve your security.

Design Principles

Design principles for security in the cloud include:

- Implement a strong identity foundation
- Enable traceability
- Apply security at all layers
- Automate security best practices
- Protect data in transit and at rest
- Keep people away from data
- Prepare for security events

Best Practices

Before you architect any workload, you need to put in place practices that influence security—such as controlling who can do what. In addition, you want to be able to identify security incidents, protect your systems and services, and maintain the confidentiality and integrity of data through data protection.

You should have a well-defined and practiced process for responding to security incidents. These tools and techniques are important because they support objectives such as preventing financial loss or complying with regulatory obligations.

The AWS Shared Responsibility Model enables organizations that adopt the cloud to achieve their security and compliance goals. Because AWS physically secures the infrastructure to support cloud services, you can focus on using services to accomplish your goals. The AWS Cloud also provides greater access to security data and an automated approach to responding to security events.

3 Reliability

The Reliability pillar encompasses the ability of a workload to perform its intended function correctly and consistently when it is expected to. This includes the ability to operate and test the workload through its total lifecycle.

Design Principles

There are five design principles for reliability in the cloud:

- Automatically recover from failure
- Test recovery procedures
- Scale horizontally to increase aggregate workload availability
- Stop guessing capacity
- Manage change in automation

Best Practices

To achieve reliability, you must start with the foundations—an environment where service quotas and network topology accommodate the workload. The workload architecture of the distributed system must be designed to prevent and mitigate failures. The workload must handle changes in demand or requirements, and it must be designed to detect failure and automatically heal itself.

Before architecting any system, foundational requirements that influence reliability should be in place. For example, you must have sufficient network bandwidth to your data center. These requirements are sometimes neglected (because they are beyond a single project's scope).

This neglect can have a significant impact on the ability to deliver a reliable system. In an on-premises environment, these requirements can cause long lead times due to dependencies and therefore must be incorporated during initial planning.

With AWS, most of these foundational requirements are already incorporated or may be addressed as needed. The cloud is designed to be essentially limitless, so it is the responsibility of AWS to satisfy the requirement for sufficient networking and compute capacity—while you are free to change resource size and allocation, such as the size of storage devices, on demand.

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Performance Efficiency

The Performance Efficiency pillar includes the ability to use computing resources efficiently to meet system requirements, and to maintain that efficiency as demand changes and technologies evolve.

Design Principles

There are five design principles for performance efficiency in the cloud:

- Democratize advanced technologies
- Go global in minutes
- Use serverless architectures
- Experiment more often
- Consider mechanical sympathy

Best Practices

Take a data-driven approach to building a high-performance architecture. Gather data on all aspects of the architecture, from the high-level design to the selection and configuration of resource types.

Reviewing your choices on a regular basis ensures you are taking advantage of the continually evolving AWS Cloud. Monitoring ensures you are aware of any deviance from expected performance. Make trade-offs in your architecture to improve performance, such as using compression or caching, or relaxing consistency requirements.

The optimal solution for a particular workload varies, and solutions often combine multiple approaches. Well-Architected workloads use multiple solutions and enable different features to improve performance.

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Cost Optimization

The Cost Optimization pillar includes the ability to run systems to deliver business value at the lowest price point.

Design Principles

There are five design principles for cost optimization in the cloud:

- Implement cloud financial management
- Adopt a consumption model
- Measure overall efficiency
- Stop spending money on undifferentiated heavy lifting
- Analyze and attribute expenditure

Best Practices

As with the other pillars, there are trade-offs to consider. For example, do you want to optimize for speed to market or for cost? In some cases, it is best to optimize for speed—going to market quickly, shipping new features, or simply meeting a deadline—rather than investing in upfront cost optimization.

Design decisions are sometimes directed by haste rather than data, and as such the temptation always exists to overcompensate rather than spend time benchmarking for the most cost-optimal deployment. This might lead to over-provisioned and under-optimized deployments.

Using the appropriate services, resources, and configurations for your workloads is key to cost savings.

Conclusion

HatchWorks' AWS Well-Architected Framework provides architectural best practices across the five pillars for designing and operating reliable, secure, efficient, and cost-effective systems in the cloud. The Framework provides a set of questions that allows you to review an existing or proposed architecture. It also provides a set of AWS best practices for each pillar.

Using the Framework in your architecture helps you produce stable and efficient systems, which allows you to focus on functional requirements.

Businesses Benefit with HatchWorks

As an AWS Select Consulting Partner, our team of AWS cloud experts provides all-in-one application and infrastructure hosting, along with a complete range of management services. Through this approach, we are able to scale and optimize your application architecture, infrastructure, security, database, cloud migrations, and BI/data analytics implementations. Best of all, we also provide Tier 2-3 application and infrastructure support—all designed for your ultimate success.

Contact HatchWorks today to learn how we can ignite your vision, accelerate your time-to-market and time-to-value, and enable you to succeed now, and in the future.

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