IOCONNECT SERVICES

The Benefits of AWS Application Development

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INTRODUCTION

When companies build software systems, they need to lay the right foundation and use the right tools and services to be successful. Without a foundation, companies face challenges when trying to build a system that delivers on their expectations and requirements.

Organizations that develop software on Amazon Web Services (AWS) should follow the AWS Well-Architected Framework with its six pillars of:

- Operational Excellence
- Security
- Reliability
- Performance Efficiency
- Cost Optimization
- Sustainability

Using AWS App Development tools and services delivers benefits that align with many of the pillars of the AWS Well-Architected Framework, empowering application developers to reduce overhead, work with smaller teams, and accelerate time to market.

This eBook explores five benefits of AWS App Development and gives an overview of key AWS tools and services. The benefits covered are:

- Performance Optimization
- Security
- Cost Optimization
- Scalability
- Integration

AWS App Performance Optimization

AWS App Development empowers companies to use computing resources efficiently to meet system requirements. Organizations can sustain this efficiency even when demands increase and technologies evolve.

Design Principles

Companies can optimize performance in the cloud by following five design principles for app development:

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

Best Practices

The four Best Practice areas for promoting performance optimization through AWS App Development are:

Organize
To set the priorities that will enable business success, your teams need to have a uniform understanding of your entire workload, their role in it, and shared business goals. Well-defined priorities will maximize the benefits of your efforts.

Prepare
To prepare for operational excellence, you need to understand your workloads and their expected behaviors. You will then be able to design them to provide insight into their status and build the procedures to support them.

Operate
Successful operation of a workload is measured by the achievement of business and customer goals. Define expectations for outcomes, determine how success will be measured, and identify metrics that will be used in those calculations to determine if your workload and operations are successful.

Evolve
You must learn, share, and continuously improve to sustain operational excellence. Dedicate work cycles to making continuous and incremental improvements. Perform post-incident analysis of all events that affect customers.

CHAPTER 1

A Data-Driven Approach to App Development

When companies take a data-driven approach to building a high-performance application development architecture, they 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 allows you to take advantage of the continually evolving AWS Cloud. Monitoring ensures you are aware of any deviations from expected performance.

AWS App Security

AWS App Development enables organizations to use cloud technologies to protect data, systems, and assets.

Design Principles

Security in the cloud has seven design principles:

- 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 architecting any workload, companies need to put security best practices in place. Your company must control who can do what, identify security incidents, protect your systems and services, and use data protection to maintain the confidentiality and integrity of data.

Best practices for security include having a well-defined and proven process for responding to security incidents. These techniques are important because they support objectives, such as preventing financial loss or complying with regulatory obligations.

AWS has a Shared Responsibility Model that enables organizations that adopt the cloud to achieve their security and compliance goals. Because AWS physically secures the infrastructure that supports cloud services, AWS customers can focus on using services to accomplish their goals. The AWS Cloud also provides greater access to security data and an automated approach to responding to security events. IO Connect builds on top of the security investments AWS has made.

AWS App Cost Optimization

AWS App Development enables companies to run systems to deliver business value at the lowest price point. A cost-optimized workload fully uses all resources, achieves an outcome at the lowest possible cost, and meets your functional requirements.

Design Principles

Cost optimization in the cloud follows five design principles:

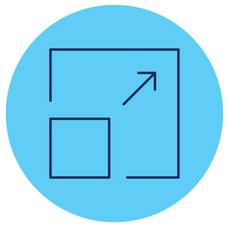
- Implement cloud financial management
- Adopt a consumption model
- Measure overall efficiency
- Stop spending money on undifferentiated heavy lifting
- Analyze and attribute costs early on when designing the architecture

Best Practices

As with the other benefits of AWS App Development, there are trade-offs to consider. For example, you need to decide whether your company's priority for optimization is speeding products to market or cutting costs.

In some cases, your company may find it makes more sense to prioritize speed instead of cost efficiency. In this case, your company would opt for going to market quickly, shipping new features, or simply meeting a deadline.

However, application design decisions are sometimes directed by haste rather than data. Succumbing to the temptation to overcompensate rather than spend time benchmarking for the most cost-efficient deployment often leads to over-provisioned and under-optimized deployments. Using the appropriate services, resources, and configurations for your workloads is the key to reducing costs. Performing load testing can help identify the costs associated with higher volumes early on, eliminating unnecessary surprises later.



AWS App Scalability

Cloud solutions need to cater to current scale requirements while anticipating future growth of the solution. This growth can be either organic or related to a merger and acquisition that causes application size to increase dramatically within a short period of time.

When a solution scales, the overall architecture experiences increased complexity related to manageability, performance, and security. By using AWS App Development tools and services, your company can avoid introducing additional complexity, degrading performance, or reducing security due to scaling.

Design Principles

A solution or service's reliability is influenced by its uptime, performance, security, and manageability. To achieve reliability in the context of scale, take into consideration the following primary design principles:

Modularity
Modularity aims to break a complex component or solution into smaller parts that are simpler and easier to scale, secure, and manage.

Horizontal Scaling

Horizontal scaling is the ability to add systems and instances automatically in a distributed manner to handle an increase in load.

Leverage the content delivery network

Leveraging Amazon CloudFront and its edge locations as part of the solution architecture can enable your application or service to scale rapidly and reliably at a global level, without adding complexity to the solution.

Go serverless where possible

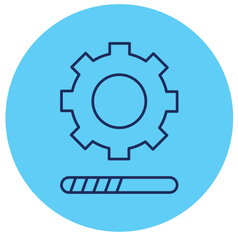
Modular architectures based on microservices reduce the complexity of the individual component or microservice. Serverless technologies offer scaling mechanisms out of the box.

Secure by design

To avoid any major changes at a later stage to accommodate security requirements, security must be taken into consideration as part of the initial solution design.

Design for failure

To achieve reliable scalability, companies must design a resilient solution, capable of recovering from infrastructure or service disruptions.



AWS App Integration

Using AWS App Development tools and services allows companies to integrate distributed systems and serverless applications with less code. App Integration on AWS is a suite of services that promotes integration by enabling communication between decoupled components within microservices, distributed systems, and serverless applications.

Benefits of AWS App Integration

The benefits of AWS App Integration services are:

Developing with agility

By using application integration services to connect your applications, you no longer need to write custom code to enable interoperability. This also limits extra code that may be repeated in your microservices and functions.

Focusing on innovation

Application integration services shift your operational responsibilities to AWS so you can focus on development and innovation. With automatic scaling, you no longer need to provision, patch, and manage servers.

Scaling and failing independently

Decoupling your app with application integration services allows them to remain interoperable, but if one service has a failure or experiences a workload spike, it won't affect the rest of them.

Messaging with confidence

Application integration messaging services can accommodate any level of throughput and uses cross-availability zone message storage to provide high availability and durability.

AWS Application Integration Services

AWS Application Integration Services include:

API Management: Create, publish, maintain, monitor, and secure APIs at any scale for serverless workloads and web applications.

Event Bus: Build an event-driven architecture that connects application data from your own apps, SaaS, and AWS services.

Messaging: Message queue sends, stores, and receives messages between application components at any volume.

No-Code API Integration: Automate the flow of data between SaaS applications and AWS services at nearly any scale, without code.

Workflows: Coordinate multiple AWS services into serverless workflows so you can build and update apps quickly.

Cloud-Native Architecture for AWS App Development

AWS tools for cloud-native architecture include Amazon DynamoDB, Amazon API Gateway, AWS Lambda, Amazon SQS, and Amazon SNS. These tools deliver benefits that meet the demands of growing companies.

Amazon DynamoDB

When Amazon DynamoDB serves as the No-SQL database, the solution keeps writing and reading times constant and keeps the schema flexibility of the data stored. The consistency provided by Amazon DynamoDB is a crucial factor in designing asynchronous transactions that help scale volume substantially.

Tenants don’t compete for service-limit quotas. Instead, control is given in throughput, and extra capacity of the service limits is reserved for unexpected bursts of read or write transactions with the on-demand capacity feature.

Amazon API Gateway

Amazon API Gateway is used for creating, publishing, maintaining, monitoring, and securing REST and WebSocket APIs at any scale. Amazon API Gateway enables developers to provide a secure and highly configurable entry point to other resources and applications inside AWS or other platforms.

AWS Lambda

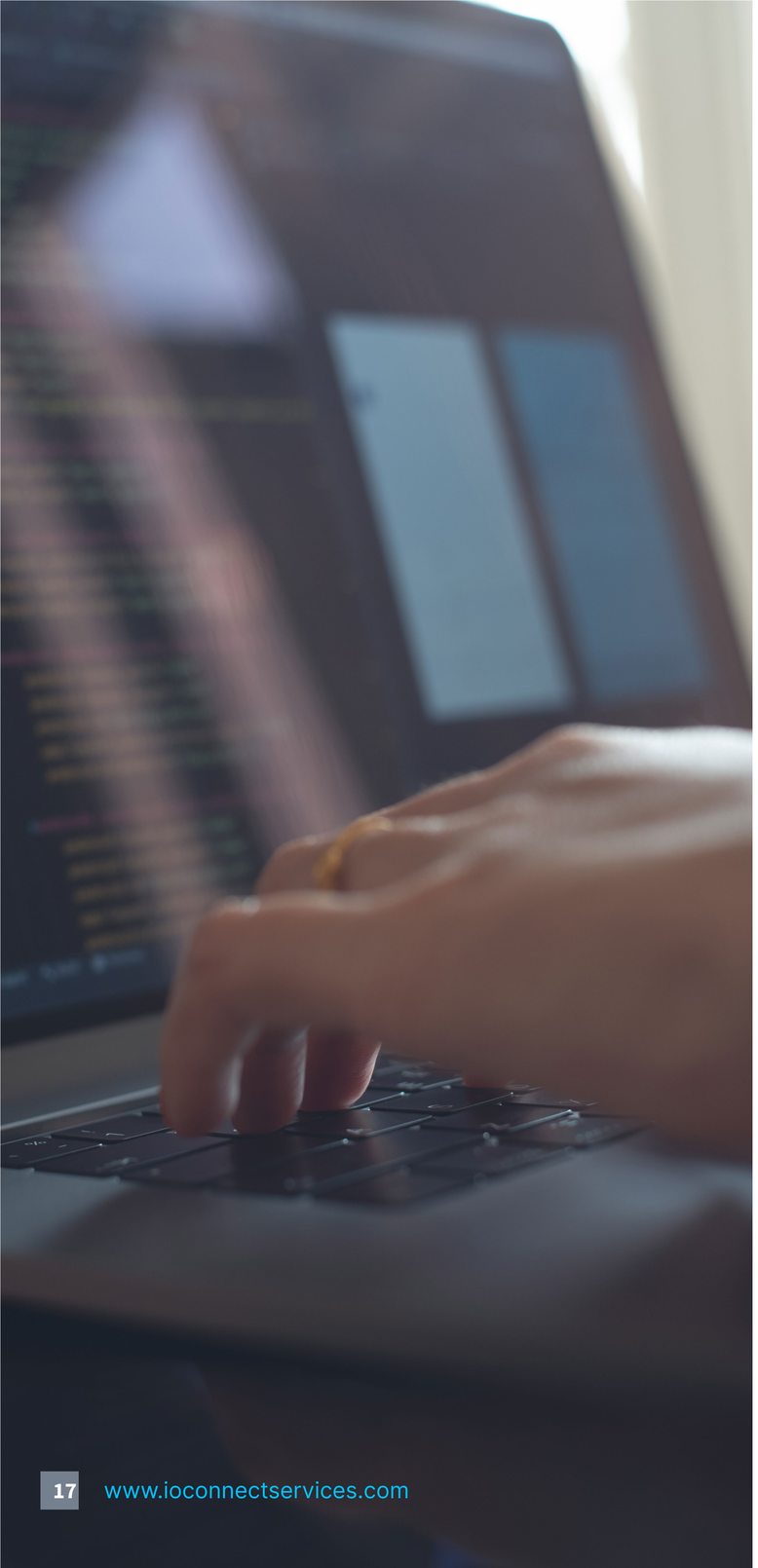
AWS Lambda is a serverless computing platform that makes it easy for developers to build applications using their own code. Lambda is a fully managed service, so no administration is needed. Architectures can be executed on demand or based on configured triggers from events.

Amazon Simple Queue Service (SQS)

Amazon SQS enables growing companies to increase application reliability and scale by providing a simple and reliable way for customers to decouple and connect microservices together using queues.

Amazon Simple Notification Service (SNS)

Amazon SNS works with other AWS services, such as Amazon SQS. Subscribers can select Amazon SQS as a delivery protocol and have notifications delivered to multiple SQS queues in parallel, providing persistence of messages and guaranteed delivery.



Experience the Benefits of AWS App Development

Using AWS App Development tools enable your company to speed products to market by following the AWS Well-Architected Framework for designing and operating secure, high-performance, resilient, efficient, and cost-effective systems in the cloud.

An AWS Well-Architected Framework Review conducted by a certified AWS Partner will help your organization determine how much your architecture is aligned with best practices and identify areas of improvement on which to capitalize.

As an AWS Advanced Tier Services Partner and part of the AWS Well-Architected Program, IO Connect has experts who can execute AWS Well-Architected Reviews using the tools provided by AWS for certified partners. Our AWS Well-Architected Review helps find common errors and make recommendations for implementation and development of products and services in the cloud.

Once we execute the Well-Architected Review process, we present a final report with prioritized recommendations for your attention and remediation. The IO Connect cloud team can help design a strategy and a work plan to optimize the evaluated infrastructure based on the findings.

Find out more about how to benefit from AWS App Development products and services. Reach out to IO Connect today.

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