



Architecture Diagrams

# Serverless Web Hosting on AWS App Runner



# Serverless Web Hosting on AWS App Runner: Architecture Diagrams

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# Table of Contents

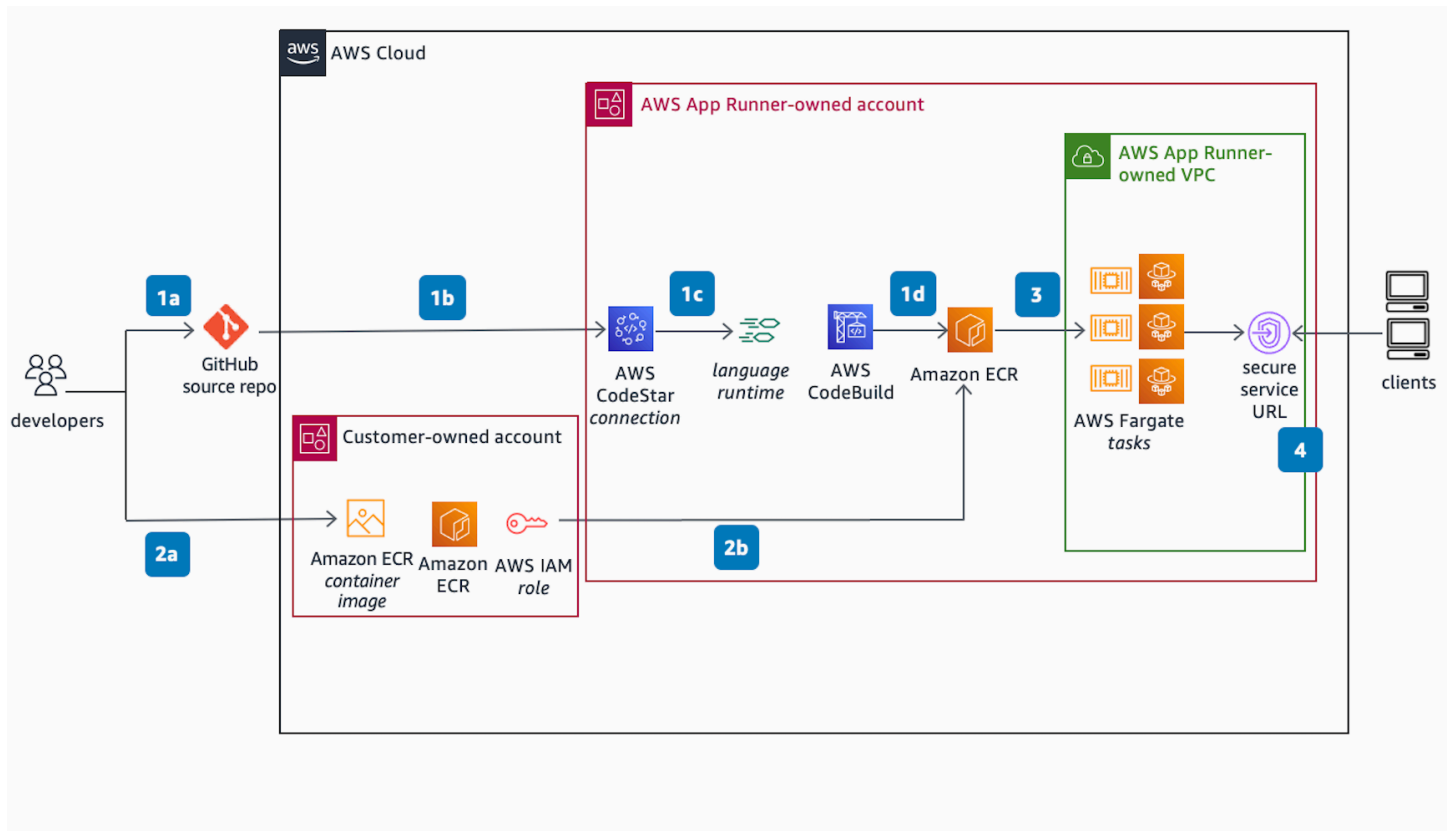
<b>Home</b> .....	<b>i</b>
Serverless Web Hosting on AWS App Runner .....	1
Serverless Web Hosting on AWS App Runner .....	3
Download editable diagram .....	4
Create a free AWS account .....	4
Further reading .....	4
Diagram history .....	5

# Serverless Web Hosting on AWS App Runner

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This reference architecture details two scenarios for how to run serverless, containerized web applications without the need to provision or manage infrastructure.

## Serverless Web Hosting on AWS App Runner



**Developer experience:** Use **AWS App Runner** to create and manage web services based on two types of service sources: source code and source image.

### 1. Scenario 1 using a source code:

- Commit code to GitHub source repo.
- Authorize access to source code in GitHub using **AWS CodeStar**.

c. Provide instructions for building and running the web service and specify a managed runtime environment supported by **AWS App Runner**. **AWS CodeBuild** then auto-packages the code and its dependencies and builds a new container image.

d. The container image is then pushed and stored into an **Amazon Elastic Container Registry (Amazon ECR)** repository, hosted within the **AWS App Runner**-owned account.

## 2. Scenario 2 using a source image:

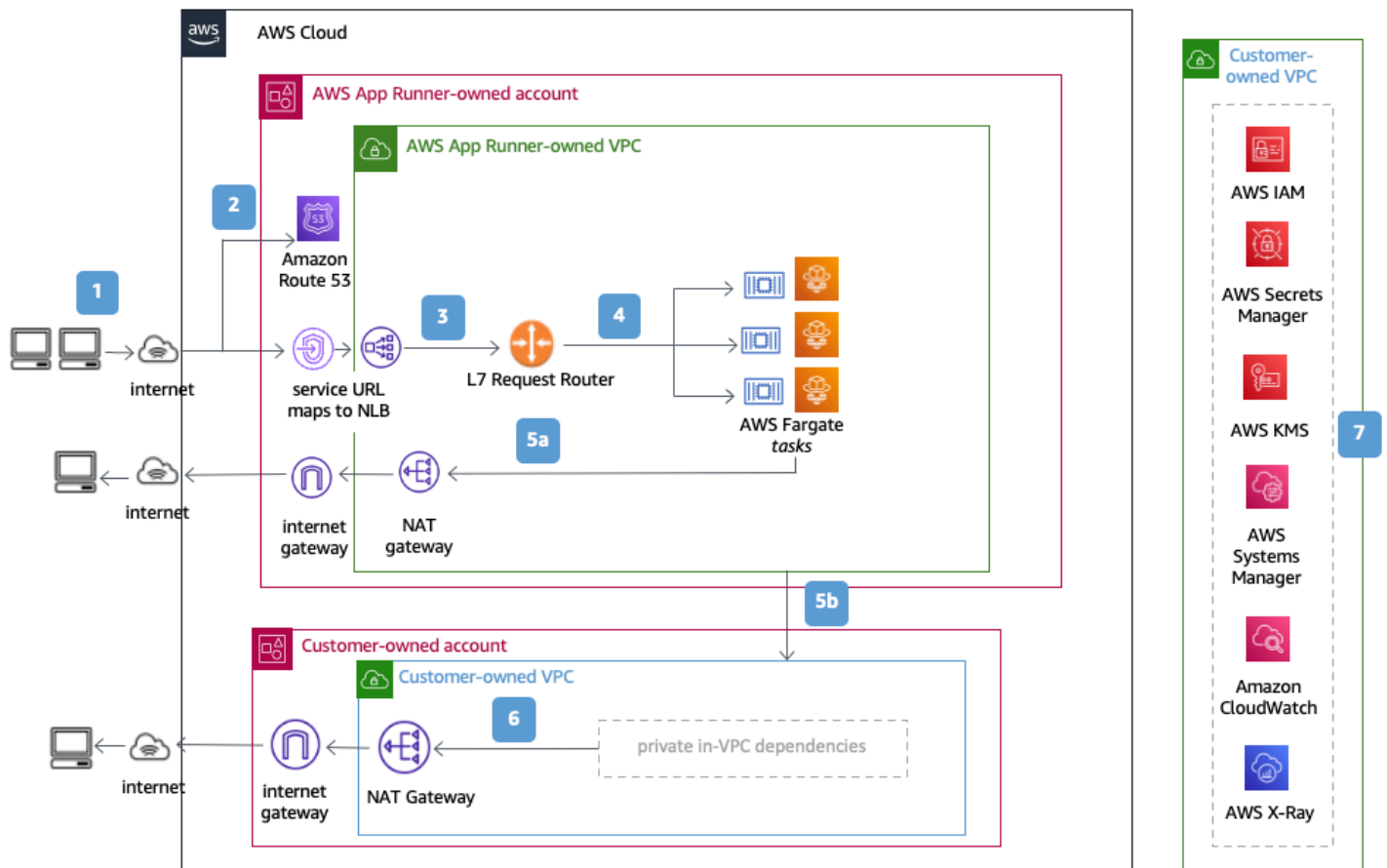
a. Alternatively, start with a pre-built image stored in a customer-managed **Amazon ECR** repository, hosted within the customer-owned account.

b. By authorizing access to the container image using an **AWS IAM Identity Center** Role, the image is then pushed and stored into **AWS App Runner**-managed **Amazon ECR** repository.

### App Runner Service creation:

3. The container image stored in **Amazon ECR** is then pulled for deployment as serverless **AWS Fargate** Tasks inside the **AWS App Runner**-owned **Amazon Virtual Private Cloud**, also known as **AWS App Runner** Service VPC. The **AWS Fargate** Tasks are deployed on an **AWS Fargate** cluster running across multiple Availability Zones for high availability in private subnets, and configured with **AWS Application Auto Scaling**.
4. A secure service URL is created/published after a successful deployment. The Secure Service URL maps to a public-facing **AWS Network Load Balancer** and is assigned a default domain name by **AWS App Runner**. Customers can also associate/map a custom domain name they own, but it must be publicly resolvable and can be registered with **Amazon Route 53** Public Hosted Zone or with any DNS provider.

# Serverless Web Hosting on AWS App Runner



**AWS App Runner** is a secure, consistent solution for exposing web applications using the public endpoint or service URL.

## Inbound traffic path:

1. Client initiates a request to the service URL.
2. The service URL is resolved to a public-facing **Network Load Balancer** using **Amazon Route 53**. The **AWS NLB** is automatically provisioned and owned by the **AWS App Runner** service.
3. The request enters the **AWS App Runner**-owned VPC through the **AWS Network Load Balancer** (AWS NLB) and is redirected to a L7 Request Router.
4. The L7 Request Router is routes incoming requests to a particular web service instance or **AWS Fargate Task**.

**Outbound traffic path, Scenario 1** (web service doesn't require access to downstream dependencies within a customer/private VPC):

5. a. Outbound (or return) traffic is routed to the internet through an **AWS-managed NAT Gateway** and an internet gateway provisioned within the **AWS App Runner**-owned VPC, or default networking mode.

**Outbound Traffic Path, Scenario 2** (web service requires access to downstream dependencies within a customer/private VPC):

b. The outbound traffic is forwarded to the customer/private-owned VPC where the private resources/dependencies are manually provisioned by the end-user/developer. Traffic is forwarded to the destination endpoint per the VPC routing table.

6. Traffic to the internet is routed through a customer-managed NAT Gateway and an internet gateway provisioned within the customer/private-owned VPC, or VPC Egress networking mode.

7. **AWS Identity and Access Management (AWS IAM)**, **AWS Key Management Service (AWS KMS)**, **AWS Secrets Manager**, and **AWS Systems Manager** Parameter Store ensure role-based access and securely store confidential data. **Amazon CloudWatch** and **AWS X-Ray** maintain observability.

## Download editable diagram

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## Further reading

For additional information, refer to

- [AWS Architecture Icons](#)
- [AWS Architecture Center](#)
- [AWS Well-Architected](#)

## Diagram history

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Change	Description	Date
<a href="#">Initial publication</a>	Reference architecture diagram first published.	May 3, 2021

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