

Service Name

Amazon ECS Anywhere

Service Overview

Amazon ECS Anywhere is a feature of Amazon Elastic Container Service (ECS) that enables running and managing containerized workloads on on-premises servers, virtual machines, or other customer-managed infrastructure. It extends the familiar ECS control plane to external environments, allowing organizations to register on-premises instances as external instances in Amazon ECS clusters. The service uses the EXTERNAL launch type and requires installation of both the Amazon ECS agent and AWS Systems Manager (SSM) agent on on-premises infrastructure. ECS Anywhere provides a consistent developer experience across AWS and on-premises environments while leveraging AWS services for container orchestration, monitoring, and security.

Key Use Cases

- Use case 1: Modernizing applications - Moving legacy applications to containers while maintaining on-premises deployment for compliance, data sovereignty, or low-latency requirements
- Use case 2: Edge computing and data processing - Running containerized data-processing workloads at edge locations on customer hardware to maintain reduced latency and process data locally
- Use case 3: Hybrid cloud architectures - Creating stretched environments that span AWS and on-premises infrastructure for gradual cloud migration, capacity bursting, or maintaining capital investments

Features

- **External Instance Registration:** Register on-premises servers or VMs as external instances in ECS clusters using activation codes and installation scripts
- **Hybrid Workload Management:** Run tasks and services across AWS and on-premises infrastructure using the same ECS APIs and tooling
- **AWS Service Integration:** Leverage AWS services like IAM, CloudWatch, ECR, and Systems Manager from on-premises environments
- **Secure Communication:** Mutual TLS authentication and encrypted communication between on-premises compute and AWS cloud with automatic credential rotation
- **Multi-Platform Support:** Support for various Linux distributions, Windows Server versions, and both x86_64 and ARM64 architectures

Value Proposition

Amazon ECS Anywhere provides organizations with a unified container orchestration platform that spans AWS and on-premises environments, eliminating the need for separate container management solutions. It enables customers to maintain existing on-premises investments while benefiting from AWS's managed services, security, and tooling:

- The service offers enhanced security features, standardized deployment processes, and cost efficiency by avoiding duplicate infrastructure management overhead
- Organizations can meet compliance requirements, handle data sovereignty concerns, and maintain low-latency workloads on-premises while leveraging AWS's scale, reliability, and extensive service ecosystem for a consistent developer experience

Service Integration

Amazon ECS Anywhere integrates deeply with core AWS services to provide comprehensive container management capabilities. Key integrations include AWS Identity and Access Management (IAM) for authentication and authorization, Amazon Elastic Container Registry (ECR) for container image storage and vulnerability scanning, AWS Systems Manager for fleet management and secure communication, Amazon CloudWatch for monitoring and logging, AWS CloudFormation for infrastructure as code deployment, and Amazon Simple Queue Service (SQS) for connecting hybrid workloads. Additional integrations include AWS CodePipeline for CI/CD across environments, AWS Application Recovery Controller for disaster recovery, and various networking and storage services to support comprehensive hybrid architectures.

Onboarding and Offboarding

Getting started with Amazon ECS Anywhere involves creating an ECS cluster with external capacity providers, generating activation codes and IDs through the AWS console or CLI, and installing required software on on-premises infrastructure. Customers must install Docker, the AWS Systems Manager Agent (SSM Agent), and Amazon ECS container agent on their servers or VMs:

- The registration process uses an installation script that securely connects the external instance to the AWS ECS cluster
- Prerequisites include an active AWS account, AWS CLI configuration, appropriate IAM roles for external instances, and supported operating systems
- The setup can be automated using infrastructure as code tools like AWS CDK or CloudFormation for consistent deployments across multiple instances

Getting Started Guide:

<https://docs.aws.amazon.com/AmazonECS/latest/developerguide/ecs-anywhere.html>

Data Removal

Offboarding from Amazon ECS Anywhere involves deregistering external instances from ECS clusters, which stops all running tasks and removes the instances from AWS management. Customers can deregister instances through the AWS console, CLI, or APIs. The process includes stopping the ECS and SSM agents on on-premises infrastructure, removing AWS credentials and configuration files, and optionally uninstalling the agents and Docker. Since ECS Anywhere primarily manages metadata and container orchestration rather than storing customer data, the offboarding process focuses on disconnecting the management plane connection and cleaning up local agent installations.

Backup/Restore and Disaster Recovery

Amazon ECS Anywhere supports backup and disaster recovery through integration with AWS services and customer-managed solutions. Container images stored in Amazon ECR benefit from native multi-region replication and backup capabilities. Task definitions, cluster configurations, and service definitions can be backed up using infrastructure as code approaches with CloudFormation or CDK. For application data, customers can leverage AWS Backup for supported services or implement custom backup strategies. The service itself provides resilience through automatic reconnection capabilities when network connectivity is restored, and customers can implement multi-region ECS clusters for disaster recovery scenarios.

Backup Capabilities

ECS Anywhere has limited native backup capabilities, focusing primarily on configuration and metadata backup rather than comprehensive data backup. The service supports backing up task definitions, service configurations, and cluster settings through CloudFormation templates and infrastructure as code approaches:

- Container images are backed up through Amazon ECR's built-in versioning and cross-region replication features
- ECS Anywhere does not directly integrate with AWS Backup for the service itself, but applications running on external instances can utilize AWS Backup for supported data stores and volumes through the AWS APIs and agents

Disaster Recovery

ECS Anywhere supports disaster recovery scenarios through its distributed architecture and AWS service integrations. The service can automatically reconnect external instances when network connectivity is restored after outages:

- For comprehensive disaster recovery, customers can deploy multi-region ECS clusters and replicate container images across regions using Amazon ECR
- ECS Anywhere does not directly integrate with AWS Elastic Disaster Recovery, but the hybrid nature allows customers to maintain business continuity by running

workloads on-premises during AWS region issues, or failing over to AWS during on-premises outages

Recovery Objectives

Amazon ECS Anywhere helps customers achieve Recovery Point Objective (RPO) and Recovery Time Objective (RTO) targets through its hybrid architecture and AWS service integrations. The service enables backup and restore strategies with RTOs of 2-4 hours for less critical workloads, while supporting warm standby and multi-site active/active architectures for sub-hour RTOs. Container image replication through ECR and infrastructure as code deployment enable consistent recovery processes. The automatic reconnection capabilities and local execution during network partitions help maintain business continuity and reduce downtime during various failure scenarios.

Service Constraints

Service Quotas:

<https://docs.aws.amazon.com/AmazonECS/latest/developerguide/service-quotas.html>

FAQ: <https://aws.amazon.com/ecs/anywhere/faqs/>

Technical Requirements

Service Documentation:

<https://docs.aws.amazon.com/AmazonECS/latest/developerguide/ecs-anywhere.html>

User Guide: <https://docs.aws.amazon.com/AmazonECS/latest/developerguide/ecs-anywhere.html>

API Reference:

<https://docs.aws.amazon.com/AmazonECS/latest/developerguide/ProgrammingGuide.html>

Pricing Overview

Please see the AWS UK G Cloud 15 Pricing Document accompanying this service in the Digital Marketplace.

Public Pricing: <https://aws.amazon.com/ecs/anywhere/pricing/>

Cost Optimization

Amazon ECS Anywhere offers unique cost optimization through its pay-per-managed-instance model at \$0.01025 per hour per registered instance, with no upfront commitments or minimum fees. Organizations can optimize costs by leveraging existing on-premises hardware investments while avoiding duplicate infrastructure management overhead:

- The service allows selective workload placement, keeping data-intensive or latency-sensitive applications on-premises while utilizing AWS for scalable components
- Cost optimization strategies include right-sizing external instances, using spot instances in AWS for burst capacity, optimizing data transfer between regions, and implementing efficient container packing to maximize resource utilization across hybrid environments

Savings Considerations

Main cost savings with ECS Anywhere include eliminating the need for separate container orchestration platforms and reducing operational overhead through unified management. Organizations save by extending the life of existing hardware investments while gradually migrating to cloud, avoiding large-scale infrastructure replacement costs:

- The service reduces staffing costs through standardized tooling and processes across environments
- Additional savings come from optimized data transfer costs by processing data locally and only transferring results, reduced licensing costs compared to traditional enterprise container platforms, and efficient resource utilization through AWS-native scaling and management capabilities that eliminate over-provisioning typical in on-premises deployments