



Modernizing Your Enterprise with AWS Outposts

Innovate faster and more effectively by bringing the cloud into
your data center, colocation space or on-premises environment

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The Road to Modernization

The pace of change in virtually every industry is quicker than it's ever been. In response to these ever-evolving conditions, organizations are being forced to innovate faster. At the same time, the need to reduce costs is ever-present. By modernizing their technology foundations, businesses can drive down overhead while putting in place the enablers of agility, efficiency and growth.

Cloud technology helps achieve these needs, simplifying IT with fully managed infrastructure and increased IT efficiency and responsiveness to business needs. It also helps to amplify developer productivity with common APIs, management, tools, and a broad ecosystem of partner solutions.

Certain workloads can be moved to the cloud relatively easily – think production workloads like media & entertainment services, e-commerce applications and Customer Relationship Management systems. Others are more challenging. Latency, data processing or data residency requirements may demand that certain data or applications reside locally. Legacy software may not (yet) be cloud-ready.

Issues such as these explain why even the most forward-thinking organizations haven't fully modernized using the cloud. What's needed is cloud services capability, delivered on-premises. AWS brings this to where customers need it through AWS Outposts.

The Problems of Incompatibility

On-premises data centers traditionally use a variety of infrastructure, tools, and APIs. This disparate assortment of hardware and software solutions results in complexity. In turn, this leads to greater management costs, the inability of staff to translate skills from one setting to another, and limits innovation and knowledge-sharing between environments.

Developers feel frustration when they have to use different services and APIs, depending on where they're working. Disparities between environments mean they demand different tools for automation, deployment, or security controls. Applications require different code and processes, depending on where they're being built. This drives inefficiency in the development process and requires team members to learn dissimilar skill sets for each environment.

IT administrators and operators remain frustrated by the complex procurement and provisioning cycles required by on-premises hardware. Procurement can involve coordinating numerous vendors and take months to get servers installed. Once installed, technicians constantly battle with the need to patch and upgrade equipment, and then face incompatibility issues across the various hardware and software components affected by those upgrades. These teams must also juggle application downtime during maintenance, so that upgrades can happen safely and minimize impact on business continuity and operations.

The business itself also faces challenges by maintaining traditional on-premises infrastructure. These legacy applications, clunky systems, and the people power required to maintain them, slows the pace of innovation.

Customers demand simplification. Technology teams want to streamline operations, unifying across on-premises and the cloud.

AWS Outposts Brings the Cloud Where You Need It



AWS Outposts offers you the same AWS hardware infrastructure, services, APIs, and tools to build and run your applications on premises and in the cloud for a truly consistent hybrid experience.

AWS Outposts is fully managed and supported by AWS, from delivery to installation to monitoring and updating. This full service reduces the time, resources, operational risk,

and maintenance downtime required for managing IT infrastructure. Your organization can order an Outposts configuration that offers the best mix of compute and storage capacity for your needs. Then AWS personnel deliver hardware to your site, connect it to power, and set up network connectivity to an AWS Region and local networks. Once installed, your team uses standard AWS APIs or the Management Console to launch Amazon Elastic Compute Cloud (EC2) instances on Outposts. Your development team can build and run apps using native AWS services that run locally on Outposts or in the connected AWS Region.

Once installed, developers benefit from one set of tools that translates to any environment, and your operations team offloads hardware procurement and maintenance to AWS support. AWS Outposts essentially brings the ease of cloud to on-premises, using the same AWS-designed infrastructure as found in AWS data centers. Cloud and on-premises sites enabled by Outposts both use the same EC2 instance types with the same Intel® Xeon® technology, helping to ease customer migration strategies. AWS and Intel have a long history of developing custom cloud solutions. Amazon EC2 instances, based on next generation Intel® Xeon® Scalable processors, enable developers to take advantage of the newest features to accelerate business innovation. The equipment used by an AWS Outposts configuration is fully managed, monitored, and operated by AWS, as though it were located in an AWS Region. To operate your Outposts capacity, you use a single pane of management in the cloud that provides the same APIs and tools you would use when operating in AWS Regions.

Getting Started with AWS Outposts

Based on the workloads identified to migrate to Outposts, the right compute and storage configuration can be chosen from a pre-validated catalog of options. Each configuration comes fully assembled with pre-validated SKUs that offer a mix of Amazon EC2 and Amazon Elastic Block Store (EBS) volumes, and built-in networking. After you place an order, AWS delivers to your site within a few weeks during your preferred delivery window. AWS installs and configures Outposts to connect to the AWS Region and your local network. After installation, you can launch and run AWS resources locally.

There are several recommended best practices to follow that make migration and modernization easier. First, it's essential for stakeholders and senior leaders within your organization to be aligned on the business objectives to be achieved by the migration. Once that is accomplished, your organization should set quantifiable measurable goals. Starting with clear objectives helps clarify the outcomes you want to achieve. It also helps to choose the right migration pattern. That can range from relatively simple, such as retiring legacy applications, to more complex, such as refactoring those applications to work in a cloud-native environment.

Some organizations do not feel at ease navigating the modernization pathway on their own. The AWS Partner Network (APN) Consulting Partners can provide expertise and training to help achieve the desired outcomes. Many also offer consulting services to help plan modernization of applications and deploy solutions. APN Technology Partners provide specific solutions that integrate with on-premises workloads using Outposts.

There is an Outposts Service Ready program for independent software vendor (ISV) solutions that have already validated their technology to run on Outposts.



Configurations and Pricing

AWS Outposts configurations are priced based on Amazon EC2 and Amazon EBS capacity. There is a minimum 3-year term commitment. Payment options include all upfront, partial upfront, or no upfront payment. The price includes delivery, installation, servicing, and removal at the end of the term. Customers can upgrade Amazon EC2 and Amazon EBS capacity.

Services that run locally on Outposts will be charged on usage only. Operating system charges are based on usage to cover licensing fees. There are no minimum fees. AWS Region data ingress and egress charges apply for data moving between Outposts and the parent region. There are no additional charges for data transfer between Outposts and the local network.



Philips: AWS Outposts in Action



In healthcare, there's a vast amount of information that physicians need access to very quickly. Philips uses technology to improve consumer, patient, provider, and caregiver experiences. It must deliver information quickly to clinicians as they treat patients. The company uses Outposts to develop and deploy applications on the same infrastructure on-premises that it does in the cloud.

"Working with Amazon Outposts fits better into some of those more critical care solutions. It allows us to extend all of the capabilities that we need to be available all the time on-prem and to make that fit seamlessly into the things that we've already developed to run in the cloud,"

Rich Ridolfo, Sr Director, Operations for Philips

Protecting Data Inside AWS Outposts

There are a number of data protection features incorporated into AWS Outposts:



Security:

AWS Outposts racks come with built-in tamper detection and an enclosed rack with a lockable door. The data stored on Outposts is encrypted and there is an encrypted network connection to the AWS Region. Plus there's other security controls and auditing mechanisms that incorporate tools such as AWS CloudTrail and Amazon CloudWatch. Also, customer data is wrapped to a physical Nitro Secure key that customers can destroy, offering an added layer of data protection.



Intel AES New Instructions (AES-NI):

Intel AES-NI encryption instruction set improves upon the original Advanced Encryption Standard (AES) algorithm to provide faster data protection and greater security. All current generation EC2 instances support this processor feature.



Durability:

On AWS Outposts, Amazon S3 and Amazon EBS are designed for durability. Durability protects against data corruption and ensures data integrity and consistency.



Compliance:

AWS infrastructure is certified for compliance with the following standards, so you can easily incorporate a backup solution that matches an existing compliance regimen.

AWS Outposts Compliance Certifications

- **Payment Card Industry Data Security Standard (PCI DSS)**, which outline compliance regulations for financial services and e-commerce service providers.
- **Health Insurance Portability and Accountability Act (HIPAA)**, which regulates how health care organizations such as health care and health insurance providers must electronically collect, create, or transmit protected health information (PHI).
- **Service Organization Controls (SOC)**, which govern service organization reporting. These controls help service organizations, which provide services to other entities, build trust and confidence in the service performed. They also prescribe controls related to the services through a report by an independent CPA. *(coming soon)*
- **International Organization for Standardization (ISO) 27001**, which establishes industry requirements for information security management systems. ISO 27001 primarily focuses on preserving the confidentiality, integrity, and availability of information as part of the risk management process. As such, it offers confidence to upstream and downstream customers. *(coming soon)*
- **Federal Risk and Authorization Management Program (FedRAMP)**, which provides a cyber security risk management program for the purchase and use of cloud products and services by organizations that work with U.S. federal government agencies. *(coming soon)*

Deciding What to Migrate to Outposts and How to Shift Workloads

There are various applications and workloads that make good candidates for migration to AWS Outposts. This list can help you prioritize your workloads as you choose what to migrate:



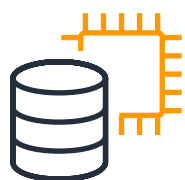
- **Edge data processing**

where compute and storage needs to be close to on-premises devices



- **Business applications**

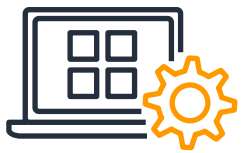
such as CRM or ERP systems, or backup and restore applications that use EBS and Amazon Simple Storage Service (Amazon S3) on Outposts



- **Relational database applications**

that use SQL are easy to set up, operate, and scale on Outposts. Two database engines are supported:

- **MySQL** has been popular for years. Support for SQL means that there are numerous potential database administrators who can help run new database instances on Outposts or in an AWS Region. Relational databases are a great fit for use cases where schemas are well-defined at the start, making the move to cloud a relatively simple one.
- If you have data requirements that need to maintain time series and geospatial data, **PostgreSQL** can be a better option. This database supports SQL, making it easy to support and manage data, but also handle data use cases with ease. For companies that require Internet of Things deployments where geospatial and location data are common, PostgreSQL makes a good choice.



- **Monolithic applications**

can be split out into interconnected microservices architectures, using Amazon Elastic Container Service (ECS) and Amazon Elastic Kubernetes Service (EKS) on Outposts. Those monoliths might include bulk data processing, such as census, industry, and consumer statistics; enterprise resource planning; and point of sale transaction processing applications.



- **High-volume workloads**

can use Outposts, leveraging Amazon Application Load Balancer (ALB) to distribute incoming traffic across multiple targets on your Outposts.

Some applications may require refactoring to use AWS services and APIs. Refactoring applications for the cloud represents a primary advantage of using Outposts, as does refactoring to run applications within container services including Amazon ECS and Amazon EKS, which can run natively on Outposts.

This process enables a monolithic application to be broken down into microservices that can then be containerized. Once the applications are refactored to run on Outposts, it is a seamless process to run these applications in one of the many AWS public regions. AWS offers cloud, database and server migration services, as well as a host of other tools that can assist with shifting workloads.

Creating a Migration Plan



After you assess that you have workloads that need to remain on-premises for latency, data residency or data processing requirements, the next step is to build a hybrid cloud architecture as part of your migration plan to support those applications as consistently as possible. This includes defining the latency required for each application, role-based secure access policies, and the network configuration for Outposts to communicate with the on-premises local network, including throughput and application performance.

With this information, you can choose the right applications to be refactored for migration to Outposts. This knowledge helps determine the right mix of AWS Services natively available on Outposts and AWS services end-points running in a region that are accessible from Outposts.

You can also use the AWS Migration Acceleration Program (MAP). MAP helps your enterprise execute a migration journey and realize the business benefits of migrating workloads to AWS. MAP provides consulting support, training, and services that reduce the risk of cloud migration. It includes a migration methodology for executing legacy migrations in a methodical way, as well as a robust set of tools to automate and accelerate common migration scenarios.

Migration Help

Amazon offers tools and services to simplify migration. Here are a few:

- **AWS Migration Acceleration Program (MAP):**
Provides consulting support, training, and services credits to help offset initial migration costs.
- **Migration Evaluator:**
Helps you build a data-driven business case for the first step of your AWS migration.
- **AWS Migration Hub:**
Offers a single location to track progress of application migrations across AWS and partner solutions.
- **AWS Migration Competency Partners:**
Validated partners with demonstrated ability to help businesses migrate applications and legacy infrastructure to AWS.

How AWS Outposts Help Modernize Your Enterprise

Through migration and modernization, enterprises can focus on business innovation rather than system and device maintenance. Outposts plays an important role in any modernization strategy and provides the bridge between on-premises and cloud environments. AWS Outposts helps your business overcome the challenges of migration and modernization.



Enables rapid scalability. Businesses can scale up Outposts configurations as needed up to hundreds of racks. The process is as simple as ordering the correct SKU.



Reduces operational costs. Organizations no longer need to maintain, upgrade, and patch hardware in their on-premises location. That responsibility is taken over by AWS and businesses can use their resources elsewhere.



Simplifies IT. Outposts does away with the complexity of procurement and provision. By bringing a fully managed service to on-premises infrastructure, business can improve IT efficiency and better respond to business needs. Plus, if you're already running your applications on Intel® Xeon® servers on-premises and benefitting from Intel software optimizations and tuning for enterprise applications, you'll enjoy the same robust performance on Outposts as well as the AWS cloud.



Amplifies developer productivity. In Outposts, developers have instant access to the same broad set of services, APIs, and tools they are used to in cloud environments.



Accelerates business innovation. By bringing cloud-type services to an on-premises environment, businesses can speed up innovation and agility.



Accommodates need for low latency and local processing. Many on-premises applications remain latency sensitive. Outposts can adapt to equipment and process that are sensitive to compute lags. Outposts helps with data intensive workloads such as augmented and virtual reality, and design and visualization output. It also manages complex workloads that work across a variety of host and storage systems.



Buys time with legacy on-premise apps that will gradually migrate to cloud. It takes capital and time to fully refactor and modernize legacy applications. Using Outposts allows gradual migration and modernization.

AWS Outposts brings the power of Amazon Cloud on-premises - redefining the hybrid relationship between the cloud and on-premises environments. AWS Outposts offers the advantages of cloud while still supporting the on-premises need for low latency, local data processing, and legacy application migration. Most hybrid solutions demand different tools, infrastructure, and operational models. When IT teams and developers no longer need to manage disparate environments, it creates a consistent developer experience and knowledge base, while decreasing operational risk. With a common set of management tools, services, and APIs, every business can tap into the agility and innovation available in the cloud, even when on-premises.





Get Started with AWS Outposts

Bringing AWS infrastructure and services closer to where you need it has never been easier.

AWS Outposts provides businesses with the same infrastructure and operating model on premises that they rely upon in the public cloud, and your business can be up and running in three simple steps: Configure, connect and launch, find out how below.

Learn more

<https://aws.amazon.com/outposts>