



Accelerate Digital Transformations in Financial Services with AWS

Discover how AWS Edge services enables the next phase of digital
transformation in financial services

- 3** Digital Transformation in Financial Services
- 4** Unlocking the Next Steps With AWS Edge Services
- 5** AWS Edge Services for Financial Organizations
- 6** Introduction to AWS Outposts
- 7** AWS Outposts: Connecting on Premises With the AWS Region
- 8** Security in AWS Outposts
- 9** Customer story: Enabling Multi-Stage Transformation at Morningstar
- 12** Sector Focus: Capital Markets, Banking, Payments, Insurance and Fintech
- 13** Customer Story: Solving Data Residency Challenges in Banking
- 14** Next Steps

Digital Transformation in Financial Services

Mobile technologies, machine learning, real-time data processing, blockchain, and many others, have transformed the world of financial services into one that's markedly different compared to even just a decade ago. These technologies are unleashing completely new business models. In their Beyond the Everyday Bank paper, Accenture estimates that new ways of doing business will have impacted up to 80% of existing banking revenues by 2020.¹

It's not surprising, therefore, that technology remains front-and-center of financial services organizations' agendas. And PwC's 19th Annual Global CEO Survey found that 81% of banking CEOs are concerned about the speed of technological change – more than in any other industry sector.²

Why cloud capabilities are key

With financial services organizations looking to bring new products and services to market quickly, enable more personalized customer experiences, unlock better use of data,

combat fraud and cybercrime, and continue to meet stringent security and regulatory requirements, cloud computing provides a powerful platform for innovation.

Cloud computing also gives flexible access to proven infrastructure, services and tools to help businesses across the financial sector test new capabilities quickly, then scale them into production.

Blending public cloud with edge, on-premises and beyond

However, requirements for low-latency, local data processing or data residency, can mean the public cloud isn't suitable for certain financial services workloads.

This is where hybrid cloud – a blend of public and on-premises or edge cloud infrastructure – makes the difference, by unlocking elements of digital transformation that haven't yet been feasible in financial services.

Unlocking the Next Steps With AWS Edge Services

AWS provides a broad portfolio of services that run at the network edge. These bring powerful data processing and storage as close to the end-point as necessary. This enables financial services organizations to benefit from cloud-style infrastructure, services and tools, while meeting their low-latency, local data processing and data residency requirements. By doing so, AWS edge services unlock the next phase of digital transformation in financial services and fintech.



Legacy liberation to enable greater responsiveness

Alongside any greenfield developments in the cloud, most financial services organizations have cumbersome legacy technology underpinning core parts of their operations.

Transforming these systems is challenging. Applications may have latency-sensitive interdependencies with other on-premises workloads; moving components to the public cloud therefore risks disrupting the business.

To transform these applications, careful planning of the multi-stage journey is essential. The process will typically need to begin with on-premises modernization, to accelerate development and reduce risks, while maintaining access to local databases. Later phases can see parts of the applications migrated to the public cloud.



Drive more value from data

New developments in data processing capabilities, analytics, artificial intelligence, machine learning and other innovations, mean fresh opportunities are continually emerging for financial services organizations to unlock greater value from their data. Drawing out new, Know Your Customers (KYC) insights to drive decision-making is a key example.

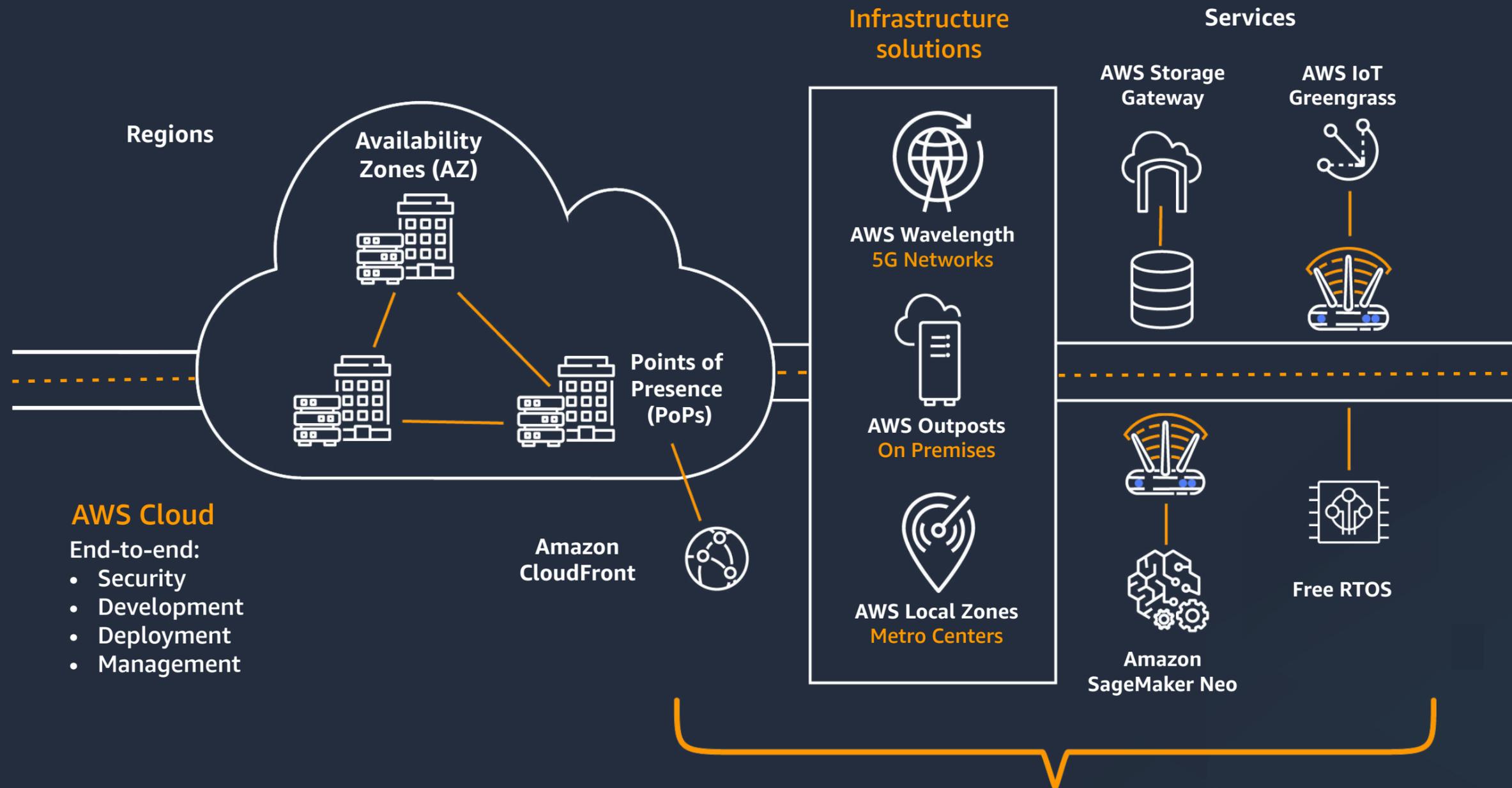
Leveraging these capabilities requires powerful compute infrastructure, large, use-case-optimized storage solutions, and access to ready-made data platforms and tools to accelerate time-to-value. However, sending these large volumes of data to and from the public cloud may not be practical or cost-effective. The solution is to deploy cloud-style services closer to the data or end-point.



Meet data residency requirements

In parallel with the challenges set out above, many financial services organizations will be required to comply with local, contractual or governmental data residency requirements, which stipulate where data must be processed or stored. For some financial services organizations, there may not be a public cloud facility in the specified location. To truly transform these parts of their operations, businesses need an alternative way of accessing cloud-style capabilities.

AWS Edge Services for Financial Organizations

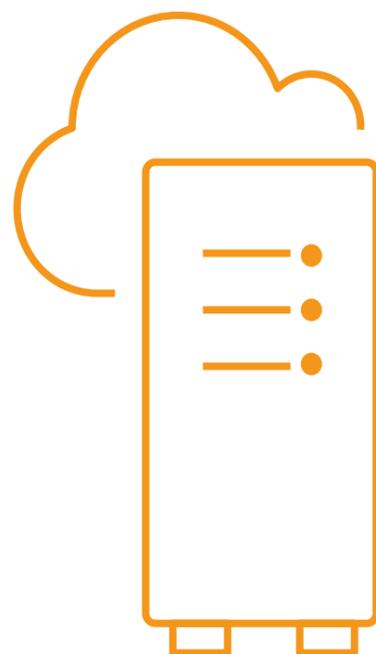


AWS Edge

- Reduce latency, process data locally, and control where your data resides
- Integrate with a broad set of cloud services and edge specific capabilities
- Reduce cost of development with single programming model

Introduction to AWS Outposts

AWS Outposts is a fully managed service that extends familiar AWS infrastructure, services, APIs and tools into virtually any data center, colocation space or on-premises facility. This is perfect for financial services workloads that need to meet data residency requirements, local data processing needs, or require low-latency access to on-premises systems.



Financial services organizations can run applications on Outposts using a range of Intel-powered Elastic Compute Cloud (Amazon EC2) instances, and run containerized workloads with Amazon Elastic Container Service (Amazon ECS) and Amazon Elastic Kubernetes Service (Amazon EKS). Additionally, data can be stored locally using Amazon Elastic Block Store (EBS), Amazon Simple Storage (Amazon S3), Amazon Relational Database (Amazon RDS) or ElastiCache, while leveraging Amazon EMR for analytics.

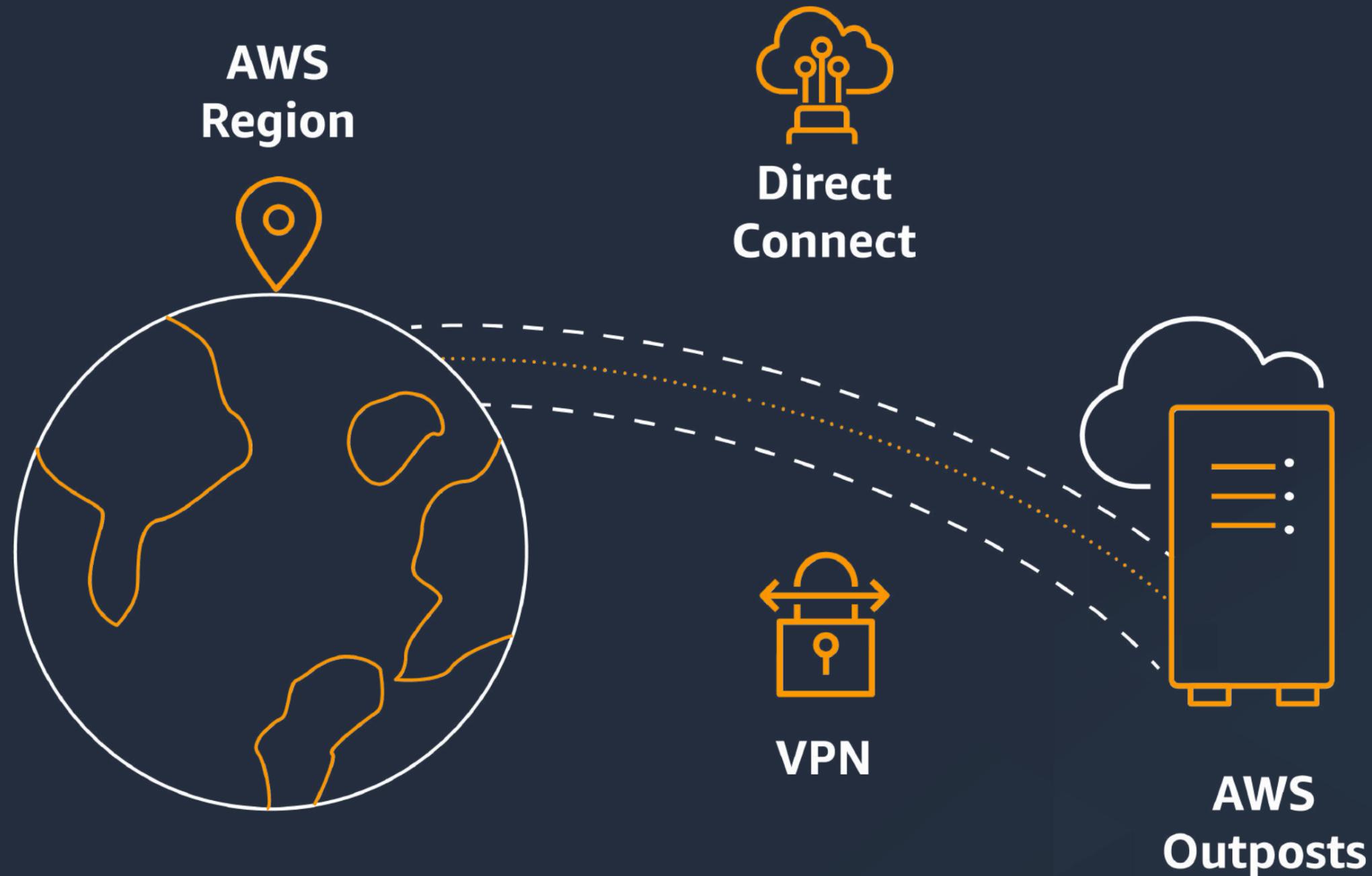
At-a-Glance: Benefits of using AWS Outposts for Financial Services

- ✓ Access flexible and scalable compute and storage
- ✓ Store and process data in local data centers, colocation spaces, on-premises facilities or beyond the network edge
- ✓ Financial-services-grade security and high-availability
- ✓ Services and tools to support fast product development and operation across the cloud, edge, on-premises and beyond
- ✓ Consistency for developers and operations teams across on-premises, the edge and the cloud
- ✓ A platform for multi-stage legacy modernization

Discover more about AWS Outposts [here](#)

AWS Outposts: Connecting on Premises With the AWS Region

Discover how AWS Outposts creates a secure bridge between on premises environments and the local AWS Region.



AWS Outposts connects to the customer's nearest AWS Region, using AWS Direct Connect or VPN, for low latency access to on-premises resources.

Security in AWS Outposts

Security and resiliency are AWS's highest priorities, and AWS understands the unique security, regulatory and compliance requirements that financial services and fintech businesses face. On Outposts, as on the rest of AWS, customers benefit from controls that have been tested and validated by third-party auditors:

- AWS monitors, patches and updates customers' Outposts infrastructure.
- Outposts hardware runs in an enclosed, lockable rack with tamper-detection.
- Every host contains an AWS Nitro Chip. The Nitro System continuously monitors, protects and verifies Outposts hardware and firmware.
- The Nitro System security model is locked down, to prevent administrative access, including by Amazon employees.
- Customer data is encrypted at rest in the Nitro System in each host. The encryption key is wrapped to an external key, in a removable device in each host. Destroying the device is equivalent to destroying the data.
- Customers can access a range of AWS tools, controls, resources and financial services security expertise to protect their workloads.

Regulatory compliance

To enable financial services clients to meet their regulatory requirements, AWS Outposts is in scope of several AWS assurance programs. As of November 2020, these include:

- PCI
- ISO
- HIPAA BAA
- IRAP
- MTCS (in specified locations)
- ENS High
- SOC

Outposts is also undergoing Joint Authorization Board review for FedRAMP and DoD CC SRG (up to IL5).

Find out more about the [AWS Compliance Program](#) and the services in scope.



Customer Story: Enabling Multi-Stage Transformation at Morningstar

Morningstar helps individuals reach their investment goals by providing tailored advisory services, based on its proprietary research and data. Key among its operations are bespoke applications.



The challenge

Morningstar wanted to modernize its software and data-collection systems, leveraging cloud services. Low-latency demands of its real-time investment research and insights services meant it needed certain workloads to remain on-premises, at least initially. The business wanted infrastructure that could provide an enhanced level of security to protect and store their customer data, while also eliminating the overheads associated with managing and monitoring different platforms on-premises and in the cloud.



The AWS solution

Morningstar selected AWS Outposts as a key pillar in its transformation journey, due to its variety of Edge services, and single programming model. Outposts is enabling the business to run virtual machines and containerized workloads on-premises, with low-latency links to other on-premises applications. AWS gives Morningstar the ability to simplify their storage management with Amazon Storage Gateway, protecting customer data with the durability and security embedded within all AWS Cloud storage services.

The Outposts environments provide a truly consistent hybrid experience across on-premises and the cloud, with full management and monitoring by AWS.



The outcomes

Adopting Outposts has enabled Morningstar to pursue a two-stage migration strategy, with workloads initially lifted to Outposts to maintain low-latency connectivity, and then seamlessly migrated to the local AWS Region once the business is ready.

The consistency across on-premises and the cloud has benefited Morningstar's development teams, while the organization is also enjoying streamlined operations and increased end user satisfaction.

"As we continue to modernize our data collection and software, we want to create a containerized hybrid infrastructure and easily deploy using AWS services. With AWS Outposts, we can build once and run applications on-premises and easily migrate our applications to an AWS Region where possible. Ultimately, this allows us to accelerate the adoption of cloud technologies within our development teams, keep up with accelerating business and customer needs, and support our long-term journey to the cloud." - James Rhodes, Chief Technology Officer at Morningstar Inc.

MORNINGSTAR[®]

Sector Focus: Capital Markets

Capital markets firms, including stock and bond markets, trading exchanges, and investment businesses, are seeking to re-think and re-engineer their operating models, implement cost savings and boost efficiency. The aspiration is for the next wave of digital transformation to accelerate go-to-market, enhance security, enrich customer experience and enable better data-driven decision-making.

AWS Outposts empower these businesses with:

- ✓ The ability to run ultra-low-latency applications across Outposts and the wider on-premises network, with the sub-millisecond response times needed for high-frequency trading
- ✓ Analytics platforms capable of processing vast amounts of market and trade data, with Amazon EMR on Outposts and links to artificial intelligence and machine learning tools at the edge and in the local AWS Region
- ✓ A platform for innovation and legacy modernization, where new technologies can be leveraged quickly and cost-effectively
- ✓ Robust security control over the location of the infrastructure

Sector Focus: Banking

For banks, the ability to respond fast to customer demands and competitor activity has never been so important. Established players face a particular challenge, confronted by increased competition from disruptors with lower cost bases and minimal legacy technology hindrance.

To remain competitive, all banks must reduce time-to-market, enhance customer experiences and refine personalization. At the same time, the need to comply with strict security, compliance and regulatory requirements is ever-present. AWS Outposts supports banks of all sizes in meeting these needs, by enabling:

- ✓ Multi-stage transformation of legacy applications, unlocking faster development, roll-out and scaling of state-of-the-art banking services, using capabilities such as EC2, EKS, ECS and ALB
- ✓ Maintenance of low-latency links to on-premises workloads, via Local Gateway Support for next-generation data capabilities that drive improved personalization, with Amazon EMR and links to artificial intelligence services at the edge or in the AWS Region
- ✓ Control over the location of data being processed and stored
- ✓ The elimination of many overheads associated with legacy IT, freeing up resources to be redeployed on innovation

Sector Focus: Insurance

Technology modernization is a big topic in the insurance industry. The cost and complexity of maintaining and renewing legacy systems are holding back innovation.

By transforming these critical parts of their businesses, insurers can enhance customer experiences, boost agility, transform their risk-identification approaches, and deliver truly personalized insurance products.

AWS Outposts supports these aims by providing:

- ✔ A platform to modernize legacy applications and databases on-premises, protecting complex dependencies and meeting data residency requirements
- ✔ Access significant capital outlay
- ✔ State-of-the-art analytics capabilities with EMR, with the option to link to artificial intelligence services at the edge and in the AWS Region, to support risk-analysis and personalization
- ✔ Reduced maintenance overheads, freeing resources to deliver the transformation

Customer Testimonial: DXC

"At DXC, we pride ourselves in delivering innovative insurance solutions. We tested DXC's Assure Digital Platform on AWS Outposts and are pleased with the consistent performance results for managed on-premises workloads. DXC is excited to bring a truly consistent hybrid cloud experience on-premises with AWS Outposts for our customers who need to meet stringent data residency requirements and a more flexible cloud journey." - Brian Bacsu, Digital Insurance Platform Engineering and Operations, DXC Technology



Sector Focus: Fintech Product and Service Vendors

Fintech businesses form an essential part of the financial services marketplace, providing the products and services on which organizations across capital markets, banking, payments and insurance can rapidly build out new offerings.

With fintech organizations' customers becoming used to accessing digital offerings as-a-service, fintech providers and independent software vendors (ISVs) are moving to offer their products in this way wherever possible.

AWS Outposts supports them on this journey, by providing:

- ✓ The ability to deploy products either on-premises or in the AWS public cloud, to meet customer data residency, low-latency or local data processing requirements
- ✓ Scalable compute, storage and other services, to underpin modern finserv products, while offering attractive pricing models for customers of all sizes
- ✓ Consistency for developers and operations teams across the AWS services, tools and APIs used on-premises and in the cloud
- ✓ Infrastructure and services that meet stringent financial services requirements

Sector Focus: Payments

Payments providers are looking to digital transformation to support real-time business decision-making, adapt to changing customer requirements, process global digital payments, increase agility and scale to meet unpredictable levels of demand.

AWS Outposts provides the platform for next-stage digital transformation, by delivering:

- ✓ Low-latency links via Local Gateway between on-premises workloads and those leveraging AWS services on Outposts, to enable and improve payment transaction gateways and overall ways of working
- ✓ Real-time data analysis capabilities, to monitor for fraud and support critical business decisions, such as how much credit to offer a particular customer
- ✓ Amazon EMR enables local processing on Outposts, with links to artificial intelligence capabilities at the edge and data lakes in the AWS Region
- ✓ Instant scalability, using ECS, EKS and ALB to handle unpredictable transaction volumes
- ✓ The ability to meet stringent security requirements, such as PCI-DSS Control over the location of payments data, as required in certain jurisdictions

Customer Story: Solving Data Residency Challenges in Banking

A well known financial services organization offers corporate, investment and personal banking services.



The challenge

This organization had a vision for next-generation customer offerings across e-wallet, mobile payments and banking. It wanted to leverage AWS capabilities to deliver these, but needed to comply with local data residency requirements, which stipulated that data must remain within their constituency. As well as this, it wanted to retain its level of security across all datasets while processing and managing data locally. It needed to ensure appropriate business continuity around these critical services, by eliminating single points of failure.



The AWS solution

This bank selected AWS Outposts as the foundation for its next-gen banking services. This would enable its technology teams to deploy modern, containerized workloads, while keeping control over where the data was stored and processed. AWS Outposts also builds on the AWS Nitro system technologies that enables AWS to provide enhanced security that continuously monitors, protects, and verifies Outpost's instance hardware and firmware.

By deploying multiple Outposts the bank has the redundancy in place to meet its business continuity requirements around these workloads.

And the use of AWS Control Tower has enabled it to implement rigorous governance and safeguards across its full AWS estate, which includes both Outposts and workloads in the AWS Region.



The outcomes

Deploying AWS Outposts enabled an accelerated digital transformation by providing the tools to analyze data at massive scale, while meeting data residency and security requirements. By using AWS Edges services, it was able to successfully launch new e-wallet, banking and mobile payment services.

Moreover, by providing a unified set of infrastructure, services, APIs and tools across its on-premises and cloud environments, the bank has seen an uptick in its development and operations teams' productivity.



Next Steps



AWS Edge services can unlock the next step in financial services digital transformation. Using Outposts, organizations of all sizes can experience all the advantages of the hybrid cloud, while meeting their low-latency, local data processing and data residency requirements.



1. Engage

Reach out to your account team or fill out our [contact form](#). Alternatively, go into the AWS Management Console.



2. Choose

Select your size and then order the Outpost rack configuration that best suits. Custom configuration is available.



3. Install and Launch

AWS will install and deliver your configuration. Use standard AWS APIs or Management Console to launch and run AWS resources locally.

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

1 https://www.accenture.com/_acnmedia/pdf-10/accenture-banking-beyond-everyday-bank-pdf.pdf
2 <https://www.pwc.com/gx/en/financial-services/assets/pdf/technology2020-and-beyond.pdf>



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