

OFFERING OVERVIEW

# AWS Outposts Powers Next-Gen Computing—With a Differentiating Twist

**AWS Joins the Next-Gen Computing Market and Adds  
Another Layer to the Location Game**



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## EXECUTIVE SUMMARY

This report provides an overview of how AWS Outposts has changed the market for next-generation computing platforms. Although the recent past of next-generation compute platforms has been characterized by bringing cloud stacks on-premises, with an Identity between the cloud and on-premises being the key success criterium, Outposts has created another layer in which enterprises can choose to run their next-generation applications.

With the launch of Outposts in December 2019,<sup>1</sup> AWS entered the market for next-generation computing platforms, significantly extending its on-premises capabilities.<sup>2</sup> Outposts allows enterprises to run a substantial number of next-generation application use cases, on-premises as well as in colocation data centers. With the latter, AWS added another level of operational platforms managed by a next-generation computing platform. Previously, no other vendor had provided a colocation offering. More choice for different workloads is good news for enterprises.

Moreover, AWS is expanding the functional scope of Outposts, which admittedly started on a smaller scale but has gained substantial value for its ability to operate workloads outside of the public cloud, thanks to Amazon's addition of the popular S3 service in September 2020.<sup>3</sup>

The other vendor offerings covered in the Constellation Market Overview are Google Anthos,<sup>4</sup> IBM Cloud Private, Microsoft Azure Stack,<sup>5</sup> and Oracle Cloud@Customer.<sup>6</sup> Also of note for readers may be the recent Offering Overview of Mirantis Docker Enterprise Container Cloud.<sup>7</sup>

### Business Themes



New C-Suite



Future of Work



Data to Decisions



Technology Optimization

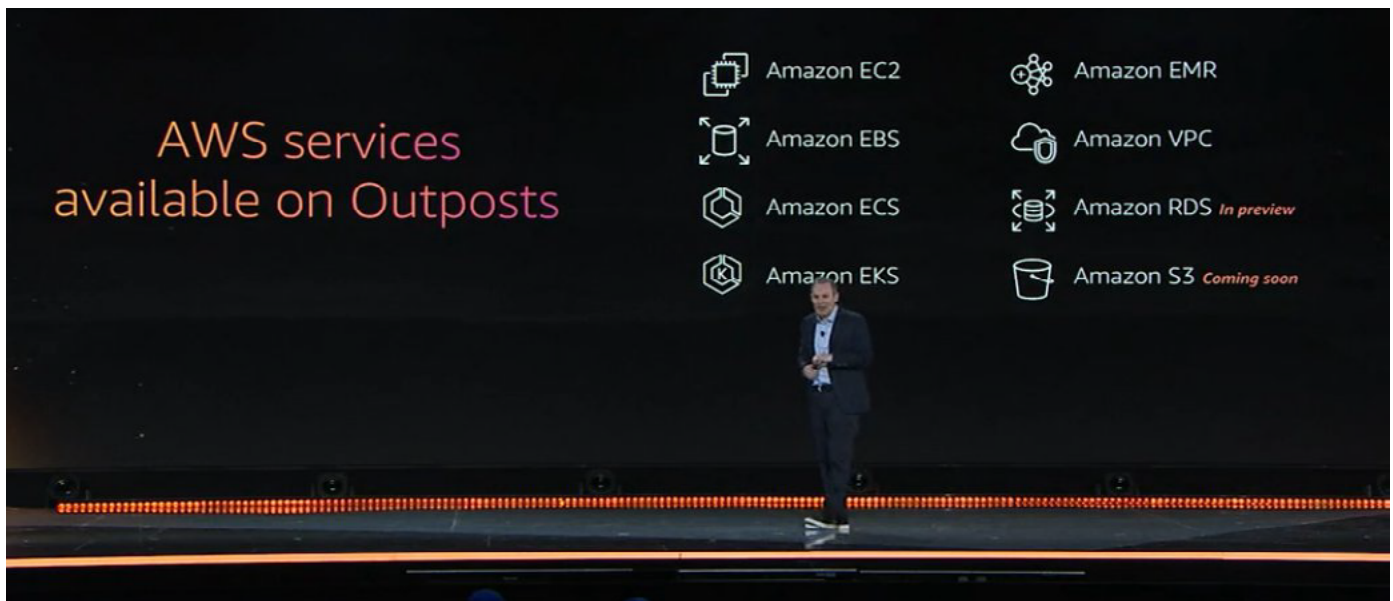
# ABOUT AWS OUTPOSTS

## Overview

As the market leader for infrastructure as a service (IaaS), AWS has held out the longest of all key public cloud players from offering a next-generation computing platform, using its market-leader privilege to position its platform as the best cloud platform and the best place to run applications. Customer requests as well as the demands of performance and latency-critical workloads in combination with growing data-residency compliance mandates led to the provision of AWS Outposts, which went into general availability in December 2019 at AWS's yearly re:Invent conference (see Figure 1).

The late market entry has not hurt AWS, though: AWS also added another option to the next-generation compute platform market with the support of colocation in data centers. Giving enterprises more options on where to deploy their next-generation applications is a good strategy, and it has been validated by both implementations and demand. Outposts came out with a basic but functional set of services, shipping with support for Amazon Elastic Compute Cloud (EC2), Elastic

**Figure 1. Andy Jassy Announces AWS Outposts at re:Invent 2019 (Amazon RDS and S3 Are Now GA)**



Source: Constellation Research

Block Store (EBS), Elastic Container Service (ECS), Elastic Kubernetes Service (EKS), and Elastic MapReduce (EMR). The general availability of Amazon RDS in July 2020 and Amazon's popular storage service S3 in October 2020 has further enabled more use cases for enterprises to run on Outposts. AWS has integrated Outposts instances well into its operational and monitoring layers, where Outposts instances are equally visible with AWS managed instances. Constellation expects AWS to continually expand the service available on Outposts.

AWS Outposts has the following key differentiators (see Figure 2):

- **AWS APIs and services where enterprises need them.** For the deployed services in Outposts, AWS offers the same API access it would if they were deployed in the regular AWS Cloud infrastructure. This API Identity is of significant value for CxOs, because it allows the portability of code assets across the different deployment options—without code change.
- **Database as a service (DBaaS) on-premises.** Enterprises need to store information for a variety of reasons, and they look for easy, high-performance, and cost-effective ways to achieve that. Outposts provides that option with EMR, RDS, and S3 managed services (aka DBaaS).

Figure 2. The AWS Outposts Value Proposition



Source: AWS

- **More deployment freedom than any other next-generation compute platform.**

Because Outposts can be deployed in colocated data centers as well as on-premises, AWS offers one more option for enterprises on where to run their next-generation applications. Outposts has enabled AWS to offer AWS Local Zones, adding another option for deployment between on-premises and an AWS Region.

- **Single pane of glass across all platforms.** Enterprises require single-pane-of-glass support for all their IT infrastructure, and Outposts gives them visibility into their operation in one consistent way like the rest of all AWS workloads do—no matter where those workloads are deployed.

## Market Segment

### Market Definition

Outposts competes in the next-generation computing platforms market as a software and services offering. A next-generation computing platform is defined as a computing paradigm that runs the same infrastructure (with some limitations) for an enterprise on-premises and in the public cloud. When it comes to AWS, that infrastructure is Outposts.

There has been a lot of confusion regarding the term *cloud*, with vendors accusing each other of “cloud washing”—that is, trying to rebrand an old product by adding the word *cloud* to its name. Cloud definitions vary from vendor to vendor and even from enterprise to enterprise.

For the purpose of this report, Constellation defines cloud as the elastic provisioning of computing, storage, and networking. The elasticity manifests itself in the form of dynamic ramping up and ramping down of resource availability, driven by workload demand, even on a per-second basis. The mechanics for this kind of computing have been established and have matured with public cloud IaaS vendors.<sup>8</sup>

CxOs who must manage on-premises workloads also find that value proposition—the elasticity of computing resources—attractive. IaaS vendors have realized this and added offerings that make parts

of their IaaS infrastructure available on-premises. Effectively, the public cloud enables the era of Infinite Computing.<sup>9</sup>

This report discusses six trends shaping the next-generation compute market.

## Market Trends

The following six market trends characterize the management of computing infrastructure (see Figure 3):

### 1. Heterogeneous Computing Demands

CxOs are confronted with rapidly changing computing demands. Beyond the challenge of satisfying the business need for big data, the computing requirements CIOs must meet range from support for machine learning, to speech recognition for internal and external digital assistant/chatbot solutions, all the way to the edge of the enterprise. New computing platforms have entered the data center—for instance, with the advent of large GPU racks to run machine learning. An unprecedented platform diversity manifests itself at the edge of the enterprise to support the Internet of Things (IoT). And the pace of change is not slowing down, as shown by new demands

Figure 3. Six Market Trends Defining a Next-Gen Computing Platform



Source: Constellation Research

for additional workforce support (e.g., augmented/mixed/virtual reality) and new user experience support (e.g., holographic displays).

## 2. Data Center Utilization

As workloads move from enterprise data centers to public cloud vendors, CIOs struggle to reach the level of utilization they intended when originally planning and investing in their data centers. One part of the challenge is the business practice of letting individual company divisions choose their own automation tools, resulting in a lower degree of predictability for available workloads in on-premises data centers. An additional hurdle for CIOs is that physical infrastructure requests are moving more slowly and have a much longer-lasting financial impact. Data center utilization can quickly change from full capacity to two-thirds utilization. Dropping a single server-refresh cycle will create that scenario, which CxOs experience as they move workloads to the public cloud.

## 3. The Need for a Single Control Plane

The era of CxOs simply accepting that new products bring a new control plane is history. CxOs operating next-generation applications<sup>10</sup> must run them as efficiently as possible, via a single control plane. This not only allows for more efficiency in managing infrastructure but also is the best way to effectively manage a heterogeneous landscape. Ramping down and ramping up resources as demand requires cannot be done from a “zoo” of instrumentation. At the same time, it is essential to automate resource scaling so that humans can focus on delivering value instead of spending time and energy on operational tasks.

## 4. Rising Complexity of IT Operations

The cloud has not fulfilled its promise to simplify IT for most organizations because they are operating on a fluid automation plane that includes the public cloud and on-premises computing resources. Business priorities, timing, and write-down cycles all determine the specific time a load may be moved to the public cloud or whether it should remain on-premises. Changes in executive management often result in a shifting workload mix (for instance, due to SaaS portfolio changes) that affects the overall computing mix. A greater diversity in workloads and new next-gen application use cases create more heterogeneity and increase the complexity of IT operations.



## 5. Compliance Pressure

Enterprises are confronted with a rise in compliance requirements that, because of the operation of larger software portfolios, affect more of the computing and storage infrastructure than ever before. Data privacy and data residency regulations often require enterprises to move loads to different physical locations, and sometimes from the cloud back to on-premises. Enterprises had not even recovered from addressing the European Union's General Data Protection Regulation when the California Consumer Privacy Act took effect, and they see more data residency rules coming their way. The rate of regulation will only increase, making CxOs desire a more fluid way to move workloads.

## 6. Degrees of Cloud Skepticism

Although many next-generation application use cases are best (and sometimes only) operated in the cloud, there is still a degree of skepticism over computing in the public cloud. It ranges from rational challenges (such as whether IaaS vendor data instances are available inside of a necessary jurisdiction) to reasonable challenges (hardware write-downs and connections to existing on-premises computing resources such as mainframes) to less-rational concerns (for instance, regarding data safety). Nonetheless, it means that CIOs need to implement and operate workloads in local data centers for at least the next decade.

# KEY CAPABILITIES

This section describes the most important capabilities of the AWS Outposts offering.

## Ubiquity of AWS Enterprise Services and APIs

As enterprises demand workload portability between the cloud and on-premises, they care about software asset portability. Building next-generation applications is an investment and risk for enterprises that, when properly executed, helps them with digital transformation or even enables digital disruption in the markets in which they operate. The result is that the next-generation application becomes an asset to the enterprise—a software asset. And CxOs want those assets not to

be hindered by legislative or technical needs but to have them available where and when they need them. Hence, identical services and APIs between cloud and on-premises platforms are crucial for a next-generation computing platform such as Outposts. The degree of Identity between the two platforms is of the essence, allowing enterprises to avoid code changes, testing, and validation in case they need to move the workloads released to their software assets (see Figure 4).

More specifically, enterprises can manage the compute needs of their next-generation applications in the same way they managed them in AWS in the cloud. Not only does this give operator familiarity in code, but it also gives them experience, because their applications will scale in the same or at least similar fashion. This is extremely valuable to CxOs, because it is important not only to have the code asset operate on a different platform but also to scale effectively on that different platform. This ensures that unnecessary overprovisioning does not need to occur and provides a consistent customer and employee experience, depending on the user profile of the next-generation application the infrastructure operates.

Moreover, Outposts is also familiar for operators, using the same observability tool as AWS in the cloud. That makes monitoring next-generation applications easier and allows operators to ensure the smooth operation of the next-generation application. This is an important confidence point for CxOs operating a next-generation computing platform—that their teams are familiar with the tools. Lastly, a

**Figure 4. Identical APIs and Tools Between AWS and Outposts**



Source: AWS

hybrid application that is using both the AWS Cloud and Outposts also can be managed by the same tool, which makes it easier to operate hybrid-natured applications and manage them successfully.

## Delivers DBaaS—On-Premises

Operating databases is complex, and database vendors can make it easier on enterprises to operate their respective databases. A DBaaS offering effectively adds a SaaS layer to the database. AWS, like all cloud database providers, effectively operates as a DBaaS vendor, because enterprises do not have access to the operational levels of the AWS databases, which are managed by AWS.

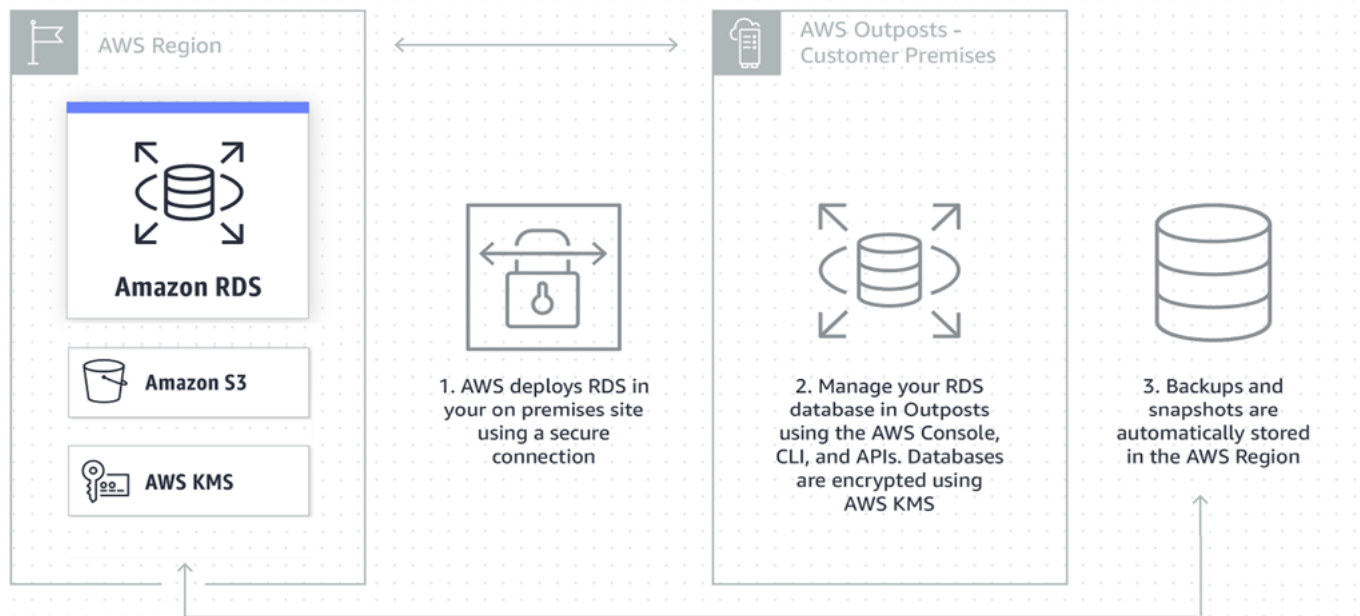
With Outposts, AWS brings the same capability to on-premises environments, in which DBaaS is a more innovative and differentiating service. Traditionally, enterprises would operate their complete on-premises stack by themselves, and this is different with Outposts, which provides managed services not only on the infrastructure side but also on the platform side—specifically for a critical piece of enterprise infrastructure, databases.

AWS offers enterprises the following data and analytic tools:

- **Amazon RDS on AWS Outposts.** Here, AWS supports MySQL and PostgreSQL database engines (see Figure 5 for RDS deployments on Outposts).
- **Amazon ElastiCache on AWS Outposts.** Here, AWS supports the popular in-memory cache that is compatible with Memcached and Redis.
- **Amazon EMR.** With EMR, Amazon brings big data on-premises.

The combination of these database offerings with the DBaaS model allows AWS to position Outposts as a DBaaS offering. AWS updates these databases automatically, in the same way as if they ran in the cloud. This gives CxOs the peace of mind that their on-premises databases will not fall behind in regard to the latest version, not only from a capability standpoint but also from a security perspective.

Figure 5. How to Deploy Amazon RDS on Outposts



Source: AWS

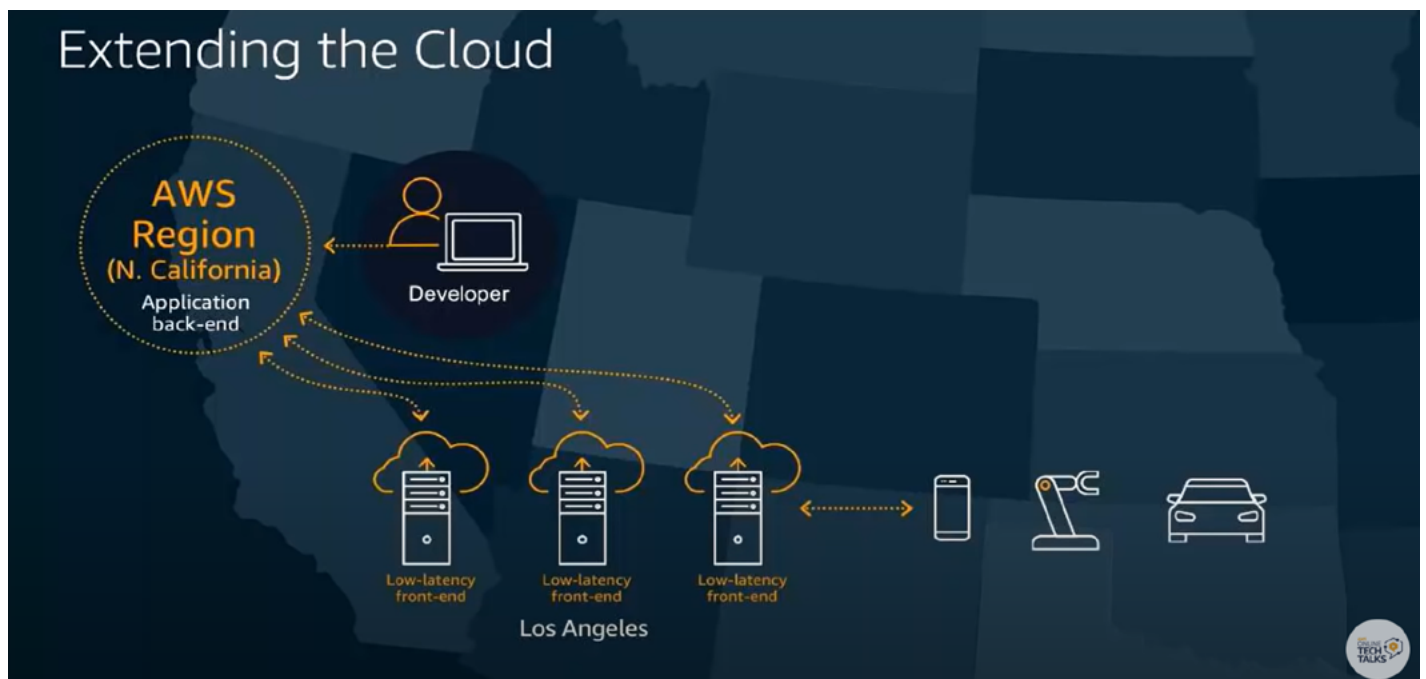
## Provides Higher Deployment Freedom

The earlier offerings in the next-generation computing platform space have provided enterprises options for deploying their workloads either in the public cloud or on-premises. AWS is now changing this by adding the ability to deploy Outposts into colocated data centers. This gives enterprise more freedom to deploy their workloads, offering not only two but a total of three deployment options (see Figure 6).

AWS provides a continuum of choices for CxOs to deploy their workloads—on-premises data centers and colocated facilities with AWS Outposts, metro city centers with AWS Local Zones, 5G networks with AWS Wavelength, and, of course, the 24-plus regions they provide globally.

This is all good news for CxOs: More choices give them more flexibility to run their next-generation applications to the best advantage for their enterprise.

Figure 6. How Outposts Extends the Public Cloud



Source: AWS

## Ensures Single Pane of Glass Across Platforms

As CxOs deploy workloads across different locations and environments, they still need to enable their teams to manage these workloads efficiently. The goal has to be that a more complex operating environment does not result in higher operational complexity that will slow down enterprises and thus decrease or even defeat the purpose of the operation.

The upside is that CxOs can give their teams the same tools for monitoring, logging, and observability when operating Outposts that they use with the AWS public cloud infrastructure. The same is valid for the operational management of these complex environments: Familiarity with a toolset is critical for DevOps and ITOps teams to do the right thing in an effective way (see Figure 7).

Importantly, Outposts allows enterprises to share the local resources with multiple AWS accounts inside the same AWS organization. This allows operators to isolate workloads and assign capacity to the desired processes, again via a familiar tool—in this case, AWS Resource Access Manager.

Figure 7. How Outposts Creates a Shared Resource

The screenshot shows the AWS Outposts console for an outpost named 'OutpostsConsoleTest' with ID 'op-0tda477575b592236'. The 'Resource sharing' tab is active, displaying a table of associated resource shares.

| Resource share ARN   | Status     | Created at | Last update |
|--|------------|------------|-------------|
| arn:aws:ram:us-west-2:824119504699:resource-share/30c7fec2-057e-4b99-d144-ebde71541d54 | associated | 2020/09/16 | 2020/09/16  |

The screenshot shows the summary details for the same outpost 'OutpostsConsoleTest'. The summary table provides key information about the outpost's configuration and ownership.

| Status               | Description       | Outpost name         | Owner ID   |
|----------------------|-------------------|----------------------|--|
| Active               | test outpost      | OutpostsConsoleTest  | 824119504699   |
| Outpost ID           | Availability Zone | Availability Zone ID | Outpost ARN  |
| op-0tda477575b592236 | us-west-2c        | usw2-az3             | arn:aws:outposts:us-west-2:824119504699:outpost/op-0tda477575b592236 |

Source: AWS

## PRICING

AWS offers different configurations for Outposts, featuring a combination of Amazon Elastic Compute Cloud (EC2) instance types, Amazon Elastic Block Store General Purpose SSD (EBS gp2) volume, and S3. Customers also can upgrade their capacity configurations as their workload demands grow over time, so they are not locked into an early and potentially wrongly sized configuration.

Outposts is available on a three-year-term contract that offers all upfront, partial upfront, and no upfront payment. AWS offers in detail:

- Development and testing units (five configurations)
- General-purpose units (seven configurations)
- Compute-optimized units (five configurations)
- Graphics-optimized units (one configuration)
- Memory-optimized units (three configurations)
- Storage-optimized units (one configuration)

Separately, EBS storage tiers (three) and S3 storage tiers (two) need to be purchased, because the above configurations do not include EBS or S3 storage.

For detailed Outposts pricing, customers can talk to their AWS representatives, or see the Pricing page here:

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

## ANALYSIS AND OBSERVATIONS

For CxOs making decisions regarding their next-generation computing platform, Outposts is an attractive offering, especially for enterprises using or seeking to bring existing AWS Cloud workloads to an on-premises environment, which mostly happens by deploying software assets in Outposts. It is good to see AWS offering the choice and continuously expanding the Outposts footprint.

## Strengths

Outposts possesses the following strengths compared with other offerings in this market space (see Figure 8):

- **Maximum Identity for the services and APIs offered.** For the set of services it provides on Outposts, AWS provides a consistent API to the service in its regions. This is key for developer efficiency and being able to run workloads in Outposts, Local Zones, Wavelength, and/or the regions.
- **DBaaS is real for AWS databases.** Being able to have a fully managed AWS database is of huge value for those enterprises that require to run them locally in Outposts. All cloud databases are complex to manage, and it is key that they can be managed remotely by AWS.
- **Single-pane-of-glass operations.** Enterprises need a single pane of glass to see the system status as the platforms execute their workloads. Having the same instrumentation and seeing them side by side, no matter where the workload runs, is key for enterprise velocity and agility.
- **Flexible consumption and pricing.** When faced with on-premises computing needs, enterprises are accustomed to payment options different from the traditional vendors' options. AWS matches this with its upfront, partial-upfront, and no-upfront (i.e., monthly) pricing options.

## Weaknesses

Outposts possesses the following weaknesses compared with offerings in this market space:

- **Relatively new offering.** Although announcements and go-lives are fast paced, Outposts is still a relatively new offering. Conservative and risk-averse CxOs will wait for Outposts' two-year mark and related customer go-lives to start considering or committing workloads to Outpost.



- **Roadmap uncertainty.** AWS traditionally does not publish roadmaps, although the company did just that for the overall delivery of Outposts through to the 2020 re:Invent. It now needs to offer the next level of roadmaps, so CxOs can plan ahead for which workloads will become portable with Outposts—and which ones will not.
- **Still a limited stack compared with AWS Cloud.** Ideally, CxOs want to be able to move any cloud workload to on-premises. Realistically, this may not make sense, but the higher Identity Outposts can achieve, the better for AWS customers.
- **Relatively high gap to rival offerings.** AWS came late to the next-generation compute platform market and has done a very good job getting its first offering out. Now, it needs to fill the gap between Outposts and its competitors, ideally with differentiated new capabilities.

**Figure 8. Outposts Strengths and Weaknesses**

| STRENGTHS  | WEAKNESSES  |
|--|---|
| <ul style="list-style-type: none"> <li>• Maximum Identity for the services and APIs offered</li> <li>• DBaaS is real for AWS databases</li> <li>• Single-pane-of-glass operations</li> <li>• Flexible consumption and pricing</li> </ul> | <ul style="list-style-type: none"> <li>• Relatively new offering</li> <li>• Roadmap uncertainty</li> <li>• Still a limited stack compared with AWS Cloud</li> <li>• Relatively high gap between Outposts and rival offerings</li> </ul> |

Source: Constellation Research

## RECOMMENDATIONS

Constellation recommends the following for CxOs looking to improve their computing architecture:

- **Enable Enterprise Acceleration.** Enterprises need to move faster than ever before, and IT/computing infrastructures cannot continue to be the shackles on agility that they have been in the past. Therefore, CxOs should look for next-generation computing platforms that allow them to transfer workloads from on-premises to the cloud and vice versa. This is a key strategy for helping the technical side of an enterprise contribute to overall business objectives and the necessity of Enterprise Acceleration.
- **Select vendors with an eye on current and future Identity.** Identity is the key to workload portability. The higher the Identity between an on-premises architecture and a cloud architecture, the better the chances to move workloads. This argument is intuitively clear to CxOs leading the transformation, and platforms with high Identity are therefore clearly preferred. But Identity is a fluid measure that rises and falls over time, so CxOs need to keep an eye on the level of Identity offered by any next-generation compute platform vendor.
- **Pick your next-generation computing platform carefully.** There are substantial value-proposition differences between the five vendors Constellation has analyzed in the underlying Constellation Market Overview. Differences in hardware provisioning, ownership in managing the offering, functionalities, and costs make these five vendors very different partners for enterprises that want to manage their next-generation applications on the right next-generation computing platform.
- **Evaluate Outposts as existing AWS customer.** Existing AWS customers should take a good look at Outposts, because it has matured as a platform and is “safe” as a platform to be used for enterprise workloads.

- **Consider the Outpost offerings as a prospect.** For enterprises that are new to next-generation compute platforms, Outposts forms a great starting point, if they choose to start their next-generation application provision on-premises. Anything running on Outposts will also run in the AWS Cloud, which may happen at a later point in workload life cycles. Outposts also is a viable development and test system to use before moving to AWS, in case an enterprise needs or wants to start on-premises with application development or porting.
- **Take a stance on commercial prudence.** Regardless the vendor, enterprises need to make sure they obtain the value they seek. For Outposts, CxOs must pay attention to ensure that subscription costs provide their enterprise with an attractive TCO. As with all services-related offerings, prices will fluctuate, need to be contractually agreed upon as long as desired, and must be constantly monitored to avoid negative commercial surprises.

## RELATED RESEARCH

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For the Market Overview, see: Holger Mueller, “Next-Gen Computing: The Enterprise Computing Model for the 2020s,” Constellation Research, September 14, 2018. <https://www.constellationr.com/research/next-gen-computing-enterprise-computing-model-2020s>

---

For the Offering Overview of Oracle Cloud@Customer, see: Holger Mueller, “Oracle Cloud at Customer Enables Next-Gen Computing,” Constellation Research, October 2018. <https://www.constellationr.com/research/oracle-cloud-customer-enables-next-gen-computing>

---

For the Offering Overview of Microsoft Azure Stack, see: Holger Mueller, “Microsoft Azure Stack Emerges as Key Next-Gen Computing Option,” Constellation Research, February 4, 2019. <https://www.constellationr.com/research/microsoft-azure-stack-emerges-key-next-gen-computing-option>

---

For the Amazon Web Services offline offerings, see: Holger Mueller, “AWS Customers Can Finally Consider Hybrid and Offline Use Cases,” Constellation Research, January 30, 2019. <https://www.constellationr.com/research/aws-customers-can-finally-consider-hybrid-and-offline-use-cases>

---

For a Constellation ShortList™ on IaaS vendors, see: Holger Mueller, “Constellation ShortList Global IaaS for Next-Gen Applications,” Constellation Research, February 20, 2018. <https://www.constellationr.com/research/constellation-shortlist-global-iaas-next-gen-applications-2>

---

For more details on Infinite Computing, see Holger Mueller, “The Era of Infinite Computing Triggers Next-Generation Applications,” June 1, 2018. <https://www.constellationr.com/research/era-infinite-computing-triggers-next-generation-applications>

---

For the people-leader perspective on the skills shortage and the need for Enterprise Acceleration, see: Holger Mueller, “Why People Leaders Must Embrace Enterprise Acceleration,” Constellation Research, July 3, 2018. <https://www.constellationr.com/research/why-people-leaders-must-embrace-enterprise-acceleration>

---

For more best-practice considerations for PaaS offerings, see: Holger Mueller, “As PaaS Turns Strategic, So Do Implementation Considerations,” Constellation Research, May 9, 2018. <https://www.constellationr.com/research/paas-turns-strategic-so-do-implementation-considerations>

---

For more on next-gen applications and PaaS offerings, see: Holger Mueller, “Why Next-Gen Apps Start With a Next-Gen Platform as a Service,” April 5, 2018. <https://www.constellationr.com/research/why-next-gen-apps-start-next-gen-platform-service>

## RELATED RESEARCH CONTINUED

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For a Constellation ShortList on PaaS vendors, see: Holger Mueller, “Constellation ShortList PaaS Tool Suites for Next-Gen Apps,” Constellation Research, February 13, 2018. <https://www.constellationr.com/research/constellation-shortlist-paas-tool-suites-next-gen-apps-1>

---

Also see: Holger Mueller, “Constellation ShortList PaaS Suites for Next-Gen Apps,” February 27, 2018. <https://www.constellationr.com/research/constellation-shortlist-paas-suites-next-gen-apps-1>

---

For additional IaaS and PaaS selection criteria, see: R “Ray” Wang and Holger Mueller, “Key Questions for Every Public Cloud IaaS/PaaS Decision Matrix,” Constellation Research, January 24, 2018. <https://www.constellationr.com/research/key-questions-every-public-cloud-iaaspaas-decision-matrix>

---

For next-generation databases, see: Holger Mueller, “Constellation ShortList Next-Gen Databases—RDBMS for On-Premises,” Constellation Research, February 27, 2019. <https://www.constellationr.com/research/constellation-shortlist-next-gen-databases-rdbms-premises-1>

---

For an example of digital transformation, see: Holger Mueller, “Lufthansa Digitally Transforms the Workplace for Flight Managers,” Constellation Research, February 27, 2018. <https://www.constellationr.com/research/lufthansa-digitally-transforms-workplace-flight-managers>

## ENDNOTES

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- <sup>1</sup> See: “Announcing General Availability of AWS Outposts,” December 3, 2019. <https://aws.amazon.com/about-aws/whats-new/2019/12/announcing-general-availability-of-aws-outposts/>
- 
- <sup>2</sup> For the Amazon Web Services offline offerings, see: Holger Mueller, “AWS Customers Can Finally Consider Hybrid and Offline Use Cases,” Constellation Research, January 30, 2019. <https://www.constellationr.com/research/aws-customers-can-finally-consider-hybrid-and-offline-use-cases>
- 
- <sup>3</sup> See: Martin Beeby, “Amazon S3 on Outposts Now Available,” September 30, 2020. <https://aws.amazon.com/blogs/aws/amazon-s3-on-outposts-now-available/>
- 
- <sup>4</sup> For the Offering Overview of Google Anthos, see: Holger Mueller, “Google Changes the Cloud Market for the Better With Anthos,” Constellation Research, December 10, 2020. <https://www.constellationr.com/research/google-gke-prem-brings-cloud-stack-data-center>
- 
- <sup>5</sup> For the Offering Overview of Microsoft Azure Stack, see: Holger Mueller, “Microsoft Azure Stack Emerges as Key Next-Gen Computing Option,” Constellation Research, February 4, 2019. <https://www.constellationr.com/research/microsoft-azure-stack-emerges-key-next-gen-computing-option>
- 
- <sup>6</sup> For more, see: Holger Mueller, “Oracle Raises the Stakes in the Next-Gen Compute Platform Market,” July 2020. <https://www.constellationr.com/research/oracle-raises-stakes-next-gen-compute-platform-market>
- 
- <sup>7</sup> For more, see: Holger Mueller, “Mirantis Delivers Container Workloads Where Enterprises Want Them: Everywhere,” September 21, 2020. <https://www.constellationr.com/research/mirantis-delivers-container-workloads-where-enterprises-want-them-everywhere>
- 
- <sup>8</sup> For a Constellation ShortList™ on IaaS vendors, see: Holger Mueller, “Constellation ShortList Global IaaS for Next-Gen Applications,” Constellation Research, August 15, 2018. <https://www.constellationr.com/research/constellation-shortlist-global-iaas-next-gen-applications-1>
- 
- <sup>9</sup> For more details, see: Holger Mueller, “The Era of Infinite Computing Triggers Next-Generation Applications,” June 1, 2018. <https://www.constellationr.com/research/era-infinite-computing-triggers-next-generation-applications>
- 
- <sup>10</sup> Holger Mueller, “The Era of Infinite Computing Triggers Next-Generation Applications,” Constellation Research, June 1, 2018. <https://www.constellationr.com/research/era-infinite-computing-triggers-next-generation-applications>

## ANALYST BIO

# Holger Mueller

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Holger Mueller is vice president and principal analyst at Constellation Research, providing guidance for the fundamental enablers of the cloud, IaaS, and PaaS with forays up the tech stack into big data, analytics, and SaaS. Mueller provides strategy and counsel to key clients, including chief information officers (CIOs), chief technology officers (CTOs), chief product officers (CPOs), investment analysts, venture capitalists, sell-side firms, and technology buyers.

Prior to joining Constellation Research, Mueller was VP of products for NorthgateArinso, a KKR company. He led the transformation of products to the cloud and laid the foundation for new business-process-as-a-service (BPaaS) capabilities. Previously, he was the chief application architect with SAP and was also VP of products for FICO. Before that, he worked for Oracle in various management functions—on both the application development (CRM, Fusion) and business development sides. Mueller started his career with Kiefer & Veitinger, which he helped grow from a startup to Europe's largest CRM vendor from 1995 onward. Mueller has a Diplom-Kaufmann from the University of Mannheim, with a focus on information science, marketing, international management, and chemical technology. A native European, Mueller speaks six languages.

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# ABOUT CONSTELLATION RESEARCH

Constellation Research is an award-winning, Silicon Valley–based research and advisory firm that helps organizations navigate the challenges of digital disruption through business model transformation and the judicious application of disruptive technologies. Unlike the legacy analyst firms, Constellation Research is disrupting how research is accessed, what topics are covered, and how clients can partner with a research firm to achieve success. Over 350 clients have joined from an ecosystem of buyers, partners, solution providers, C-suite, boards of directors, and vendor clients. Our mission is to identify, validate, and share insights with our clients.

## Organizational Highlights

- Named Institute of Industry Analyst Relations (IIAR) New Analyst Firm of the Year in 2011 and #1 Independent Analyst Firm for 2014 and 2015.
- Experienced research team with an average of 25 years of practitioner, management, and industry experience.
- Organizers of the Constellation Connected Enterprise—an innovation summit and best practices knowledge-sharing retreat for business leaders.
- Founders of Constellation Executive Network, a membership organization for digital leaders seeking to learn from market leaders and fast followers.



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