

The Continuous Intelligence Report

The state of modern applications & DevSecOps in the cloud



Fourth annual report, 2019 edition

sumo logic

The rise of modern applications, DevSecOps and the Intelligence Economy

Sumo Logic Continuous Intelligence Platform

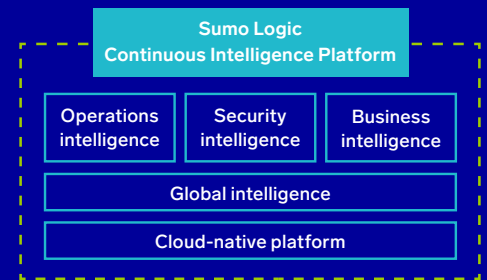
Sumo Logic delivers the leading, cloud-native, Continuous Intelligence Platform designed to help digital businesses close the intelligence gap created from the tsunami of data generated from their modern application architectures and cloud infrastructures. Sumo Logic offers a suite of solutions to win the intelligence gap across operations, security and business use cases.

More than 2,000 customers around the globe rely on Sumo Logic for the intelligence and insights to build, run and secure their modern applications and cloud infrastructures.

New trends in application architectures, processes, tools and use cases

This fourth annual report is the first and only industry report that quantitatively defines the state of the modern application stack and its implication to the growing technology, process and culture shift amongst our customers to DevSecOps.

Working with leading-edge enterprises, Sumo Logic has identified key trends in modern application architecture and management.



Rise of modern applications

Today's leading enterprises are striving to deliver high performance, and highly scalable, always-on digital services. These services are built on custom, "modern architectures" – an application stack with new tiers, new technologies, and microservices – typically running on cloud platforms such as Amazon Web Services (AWS), Microsoft Azure, or Google Cloud Platform.

Rapid adoption of DevSecOps

Many enterprises that build cloud applications are adopting DevOps/DevSecOps tools and processes to improve software agility and reliability. Given the ephemeral nature of these modern applications, traditional monitoring, troubleshooting and security management solutions fall short. The only way to manage this lifecycle is through a cloud-native, Continuous Intelligence Platform. With a Continuous Intelligence Platform, digital companies can automate and monitor their end-to-end application lifecycle (development → operations → security) processes.

Rise of the Intelligence Economy

Modern application and cloud architectures are producing enormous quantities of data pressuring companies to analyze and act upon to drive great customer experiences. We call this, the Intelligence Economy. Companies that fall behind this real-time accountability are mired in an intelligence gap.

Closing the intelligence gap requires a Continuous Intelligence Platform to manage operations, ensure application security and compliance, and derive business insights to understand end-customer behaviors. Only Sumo Logic delivers this platform based on a true, multi-tenant, SaaS architecture, enabling digital businesses to thrive in the Intelligence Economy.

The rise of modern applications, DevSecOps and the Intelligence Economy

Why is Sumo Logic uniquely positioned to create this report?

For over nine years, Sumo Logic has provided the leading cloud-native, Continuous Intelligence Platform analyzing over 100 petabytes of data daily from a wide variety of modern application, infrastructure, development, security and operations tools. The analysis of this data provides ground-breaking insights into application architectures, teams, processes and tools used by enterprises of all sizes to build, run and secure next-generation modern applications and cloud infrastructures.

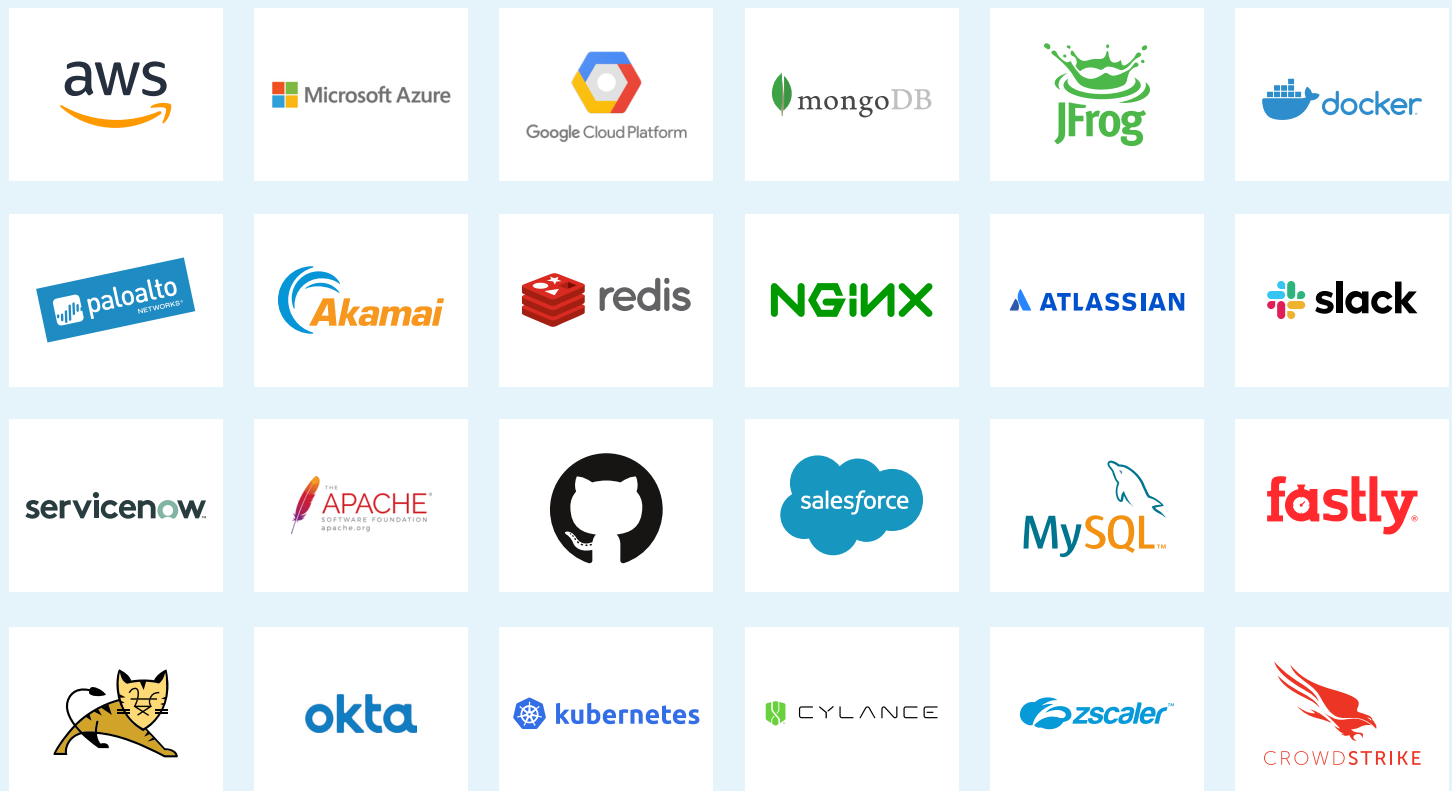
What does this report provide?

The primary goal of this report is to provide data-driven insights and intelligence, best practices and trends by analyzing

technology adoption among Sumo Logic customers who run massive mission-critical modern applications on cloud platforms like AWS, Azure, and Google Cloud Platform as well as hybrid cloud infrastructure. This report also provides additional trends and important visibility into the DevSecOps tools/solutions that are used within cloud-first organizations as they "lift and shift" or modernize and migrate existing applications.

Who should read this report?

Cloud Architects, Site Reliability Engineers (SREs), Data Engineers, Operations teams, DevOps and Chief Information Security Officers (CISOs) as well as Security Operations teams and practitioners should leverage the learnings from this report as they look to build, run and secure modern applications and cloud infrastructures effectively and securely.



Data methodology and assumptions

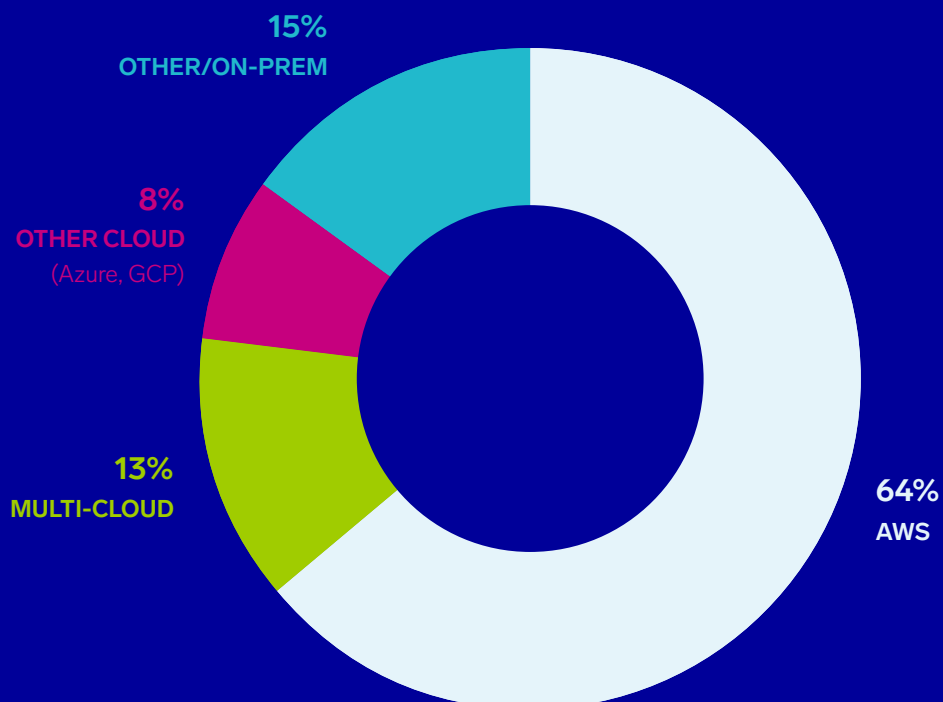
This data is derived from over 2,000 Sumo Logic customers running applications on all major cloud platforms and on-premise environments. All individual customer data is anonymized.

Customers use Sumo Logic to manage production applications and underlying infrastructure. Hence, this report provides a snapshot of the production application state.

The Sumo Logic Continuous Intelligence Platform runs in the cloud. The experience and expertise of running our mission-critical, massive, analytics service is also leveraged in this report.

This report assumes that an application or infrastructure is used in production if it appears as a source of data or is queried/analyzed by a paying customer.

Breakdown of Sumo Logic customers



* Data ingest volume can vary from customer breakdown

Key takeaways



1

Multi-cloud adoption has grown by 50% since last year. AWS still dominates by marketshare.



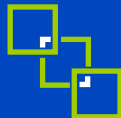
2

Kubernetes (K8s) adoption continues to grow. We also see significant K8s adoption in multi-cloud customers.



3

Open source has disrupted the modern application stack with open source solutions for containers, orchestration, infrastructure and application services leading this transformation. 4 in 6 application infrastructure platforms include open source technologies.



4

A typical enterprise uses 15 AWS services from 150+ available. The adopted services are compute, storage, database, and network. Of the ancillary services like tooling and management, few are broadly adopted by enterprises.



5

Serverless has reached a tipping point: 1 in 3 enterprises uses AWS Lambda in production. AWS Lambda is also used a lot in non-production use cases and has become one of the top 10 AWS services by adoption.



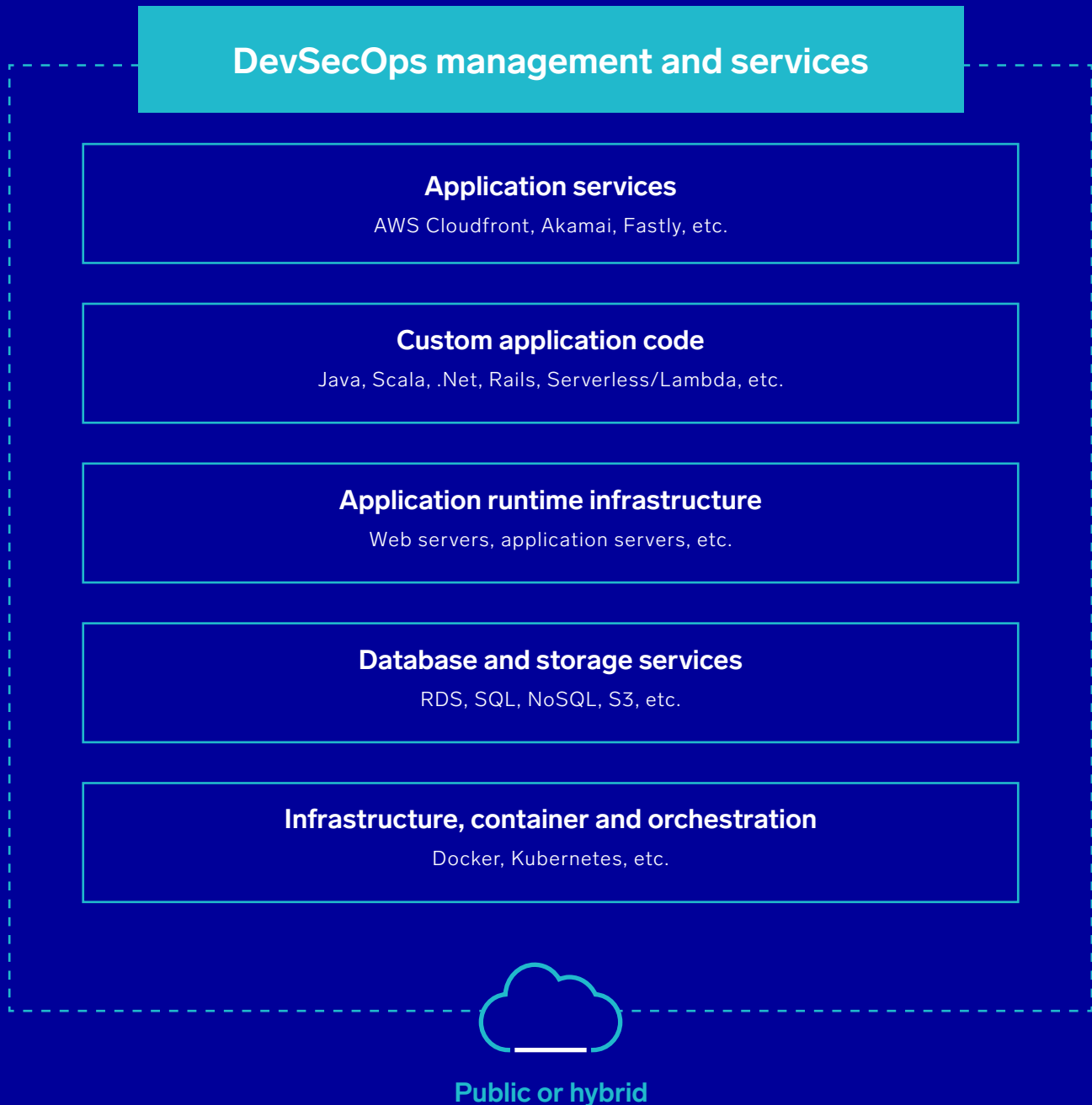
6

Significant use of AWS native security and threat intelligence services shows that enterprises are continuing to adopt next-gen and cloud-hosted security technologies.

The modern application stack

This report focuses on the new modern applications in the cloud and highlights:

- New tiers making up the modern application stack.
- New technologies emerging as leaders within these tiers.
- New services enabling application operations and security management.



Adoption of individual IaaS services suggests enterprises are trying to avoid vendor lock-in

Context

- There are more than 150 discrete services marketed and available for consumption in AWS spanning compute, network, storage, database, tooling, management, security, developer tools, analytics, etc.

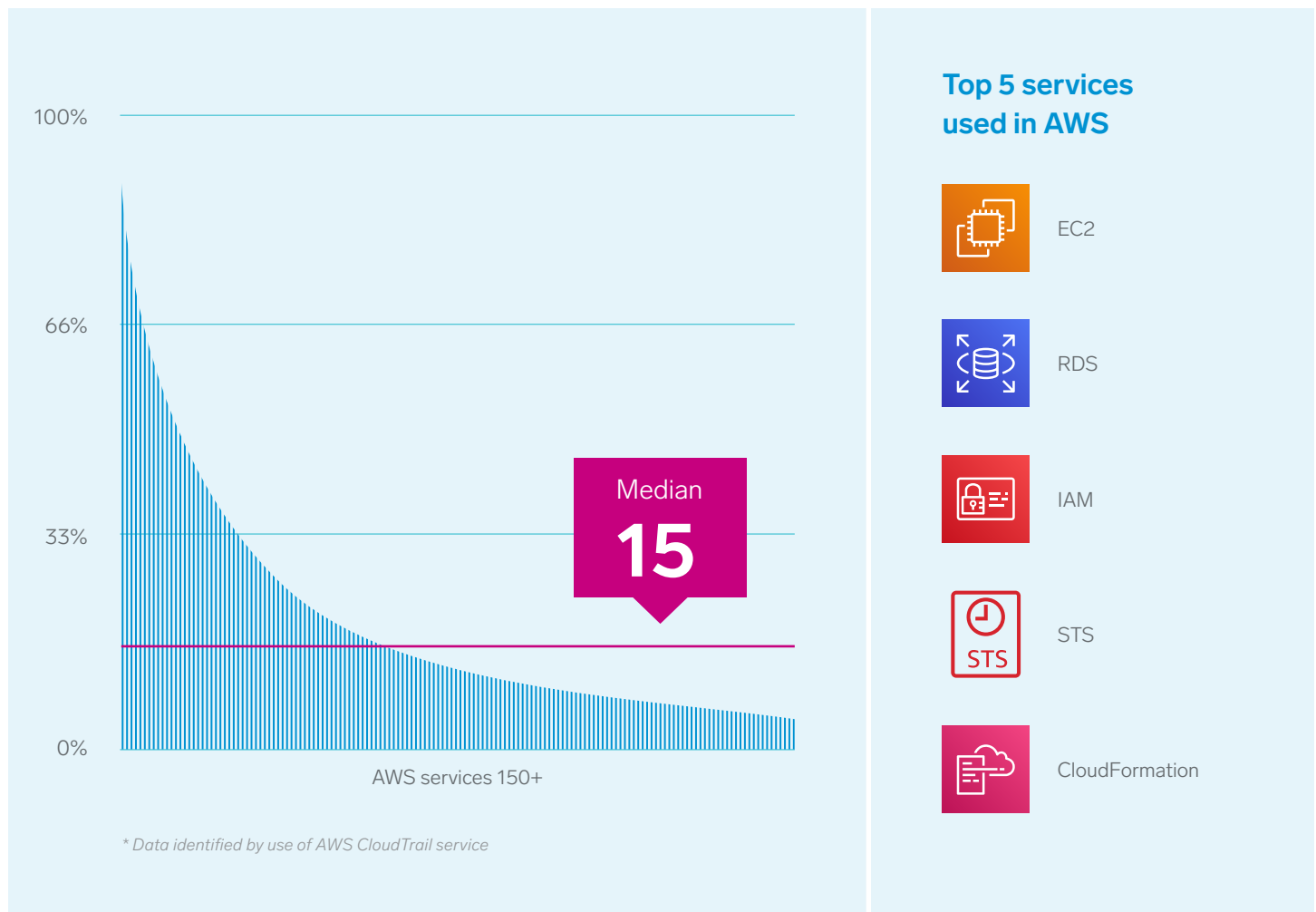
Findings*

- Adoption of AWS services demonstrates fewer than 10% of services are broadly adopted by the majority of customers. There is a long-tail of services only sparsely adopted.
- Basic compute, storage, database, network, and identity services make up the top 10 adopted services in AWS.
- Management, tooling, and advanced security services are adopted at a significantly lower rate than core infrastructure services.

Choice of cloud service adoption impacts enterprise's ability to preserve and retain flexibility and choice of providers.

To support a multi-cloud strategy, pay close attention to the adoption of services that might lock you into a single provider.

In particular, choose management and security offerings from third-party vendors to easily port or manage multi-cloud environments.



Docker adoption in AWS continues to grow



Context

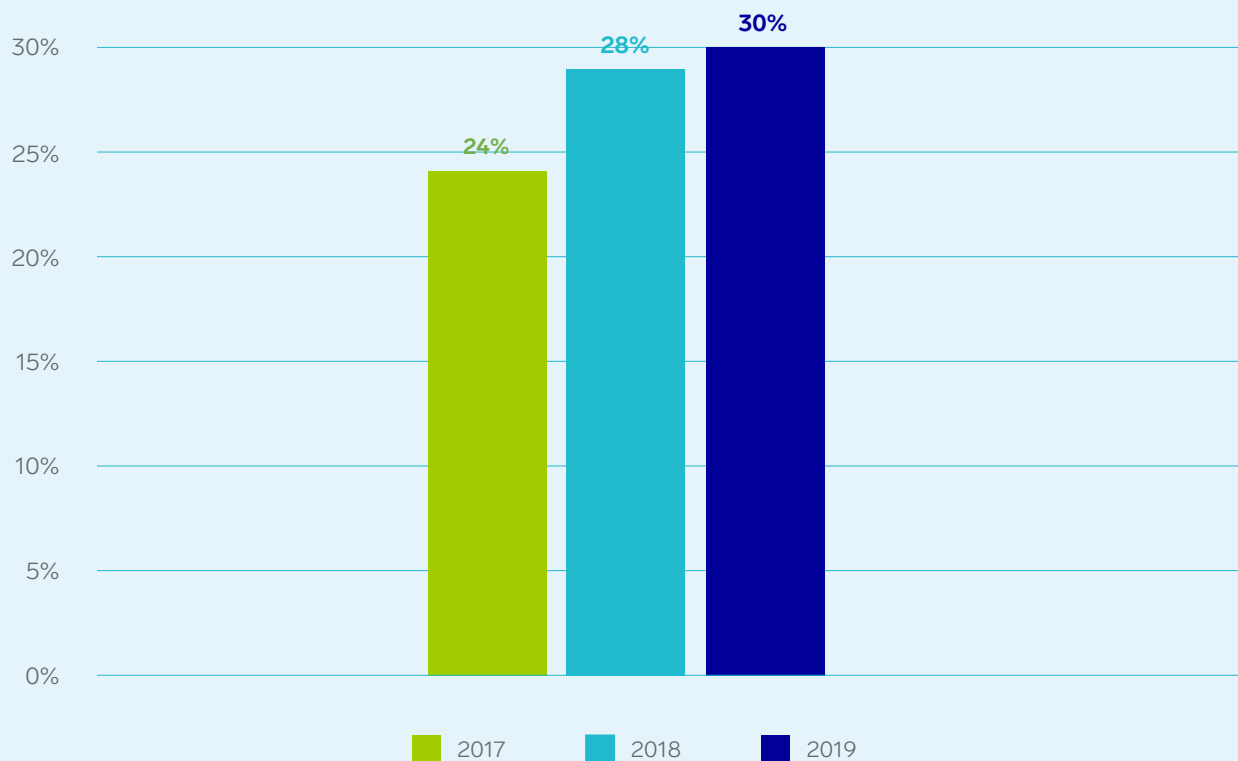
- Container technology like Docker enables DevOps teams to build, ship, and run distributed applications more efficiently.
- Docker is also an excellent infrastructure choice to build microservices.

With 30% of enterprises using Docker, it's clear that Docker is a critical foundational layer for modern applications. Enterprise should evaluate microservice/container based architecture for their next-gen applications.

Findings

- 1 in 3 enterprises in AWS use Docker currently.
- Significant adoption of Docker also implies growing use of microservices-based applications.

Docker adoption in AWS



Kubernetes is winning the orchestration war



Context

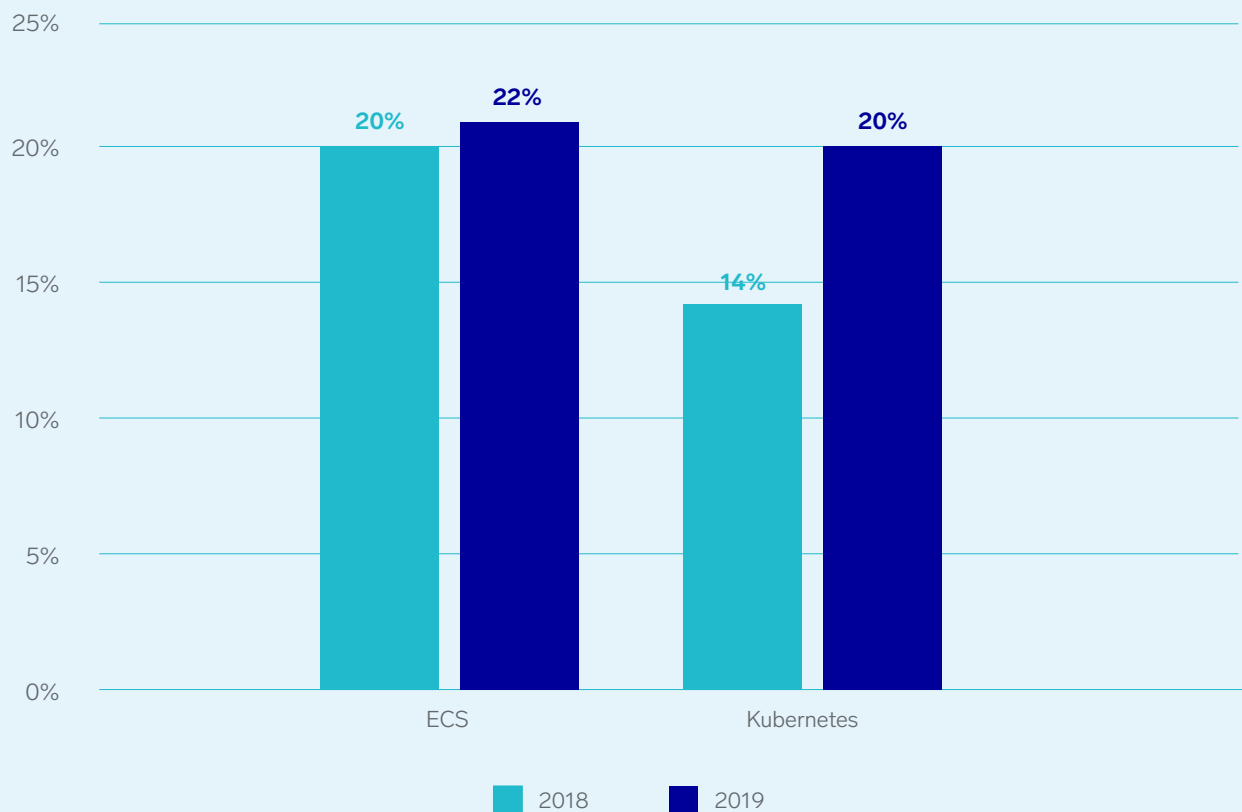
- Orchestration technologies automate the deployment and scaling of containers.
- They also ensure reliability of applications and workloads running on containers.

Expect widespread Kubernetes and EKS (Elastic Kubernetes Service) adoption in AWS in the next few years; we also expect widespread adoption of Google and Azure managed Kubernetes services.

Findings

- 1 in 3 AWS customers use an orchestration technology.
- Kubernetes growth in the last 12 months is significantly higher than that of other orchestration technologies in AWS.

AWS customers using orchestration



Kubernetes dominates in multi-cloud environments



Context

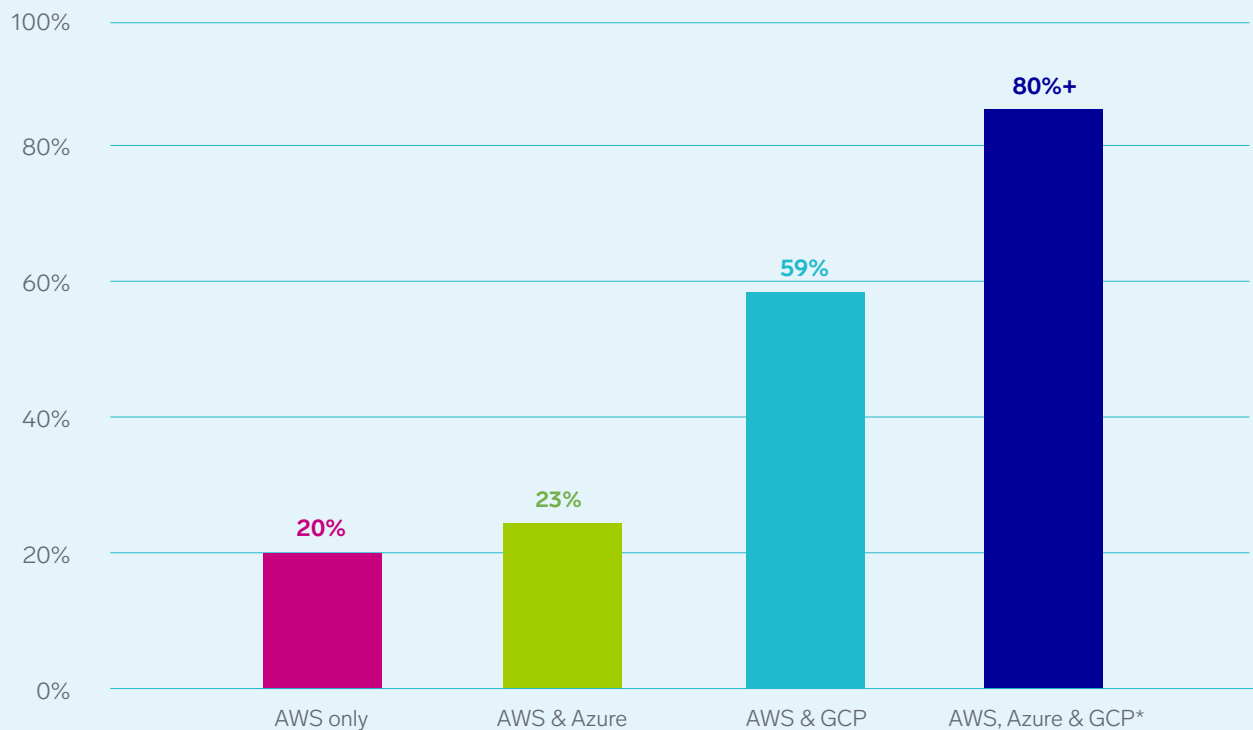
- Kubernetes offers broad multi-cloud support and can be leveraged by many organizations to run applications across on-prem and cloud environments.

Findings

- Multi-cloud use is highly correlated with higher Kubernetes adoption.
- GCP users adopt Kubernetes at a higher rate than users of other clouds.

Enterprises are betting on Kubernetes to drive their multi-cloud strategies. It is imperative that enterprises deploy applications on Kubernetes to easily orchestrate/manage/scale applications and also retain the flexibility to port applications across different clouds.

Kubernetes - multi-cloud adoption trends



* Based on early customer data

NoSQL leads RDBMS database adoption in the cloud



Context

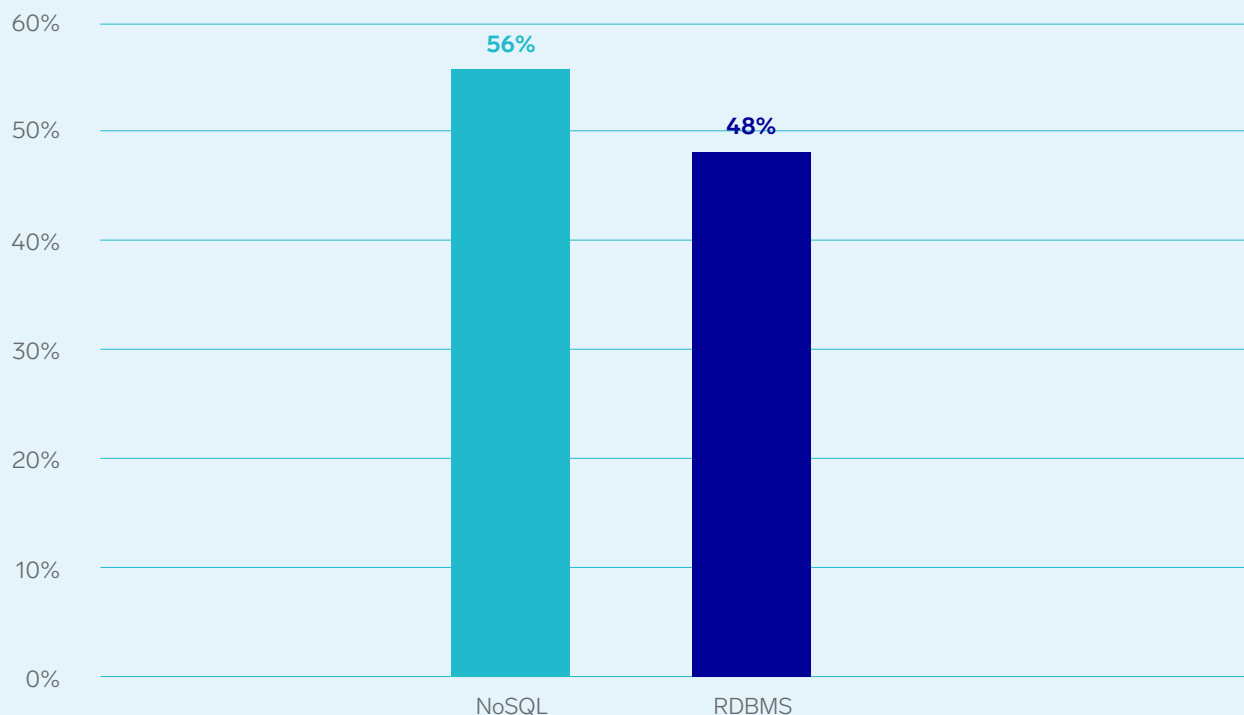
- Databases are at the core of many applications.
- Application architects have several database choices while migrating to cloud — Relational DB, NoSQL DB (including in-memory DB), etc.

Cloud migration and microservices based architectures provide the opportunity to make an optimal choice of back-end data stores and optimize for the right application use cases.

Findings

- The adoption of NoSQL databases has overtaken traditional RDBMS databases in AWS environments.

Database adoption in AWS



3 of 5 top databases in AWS are NoSQL



Context

- Enterprises have many choices for database technology — open source, commercial, relational, NoSQL, in-memory, disk-based etc.

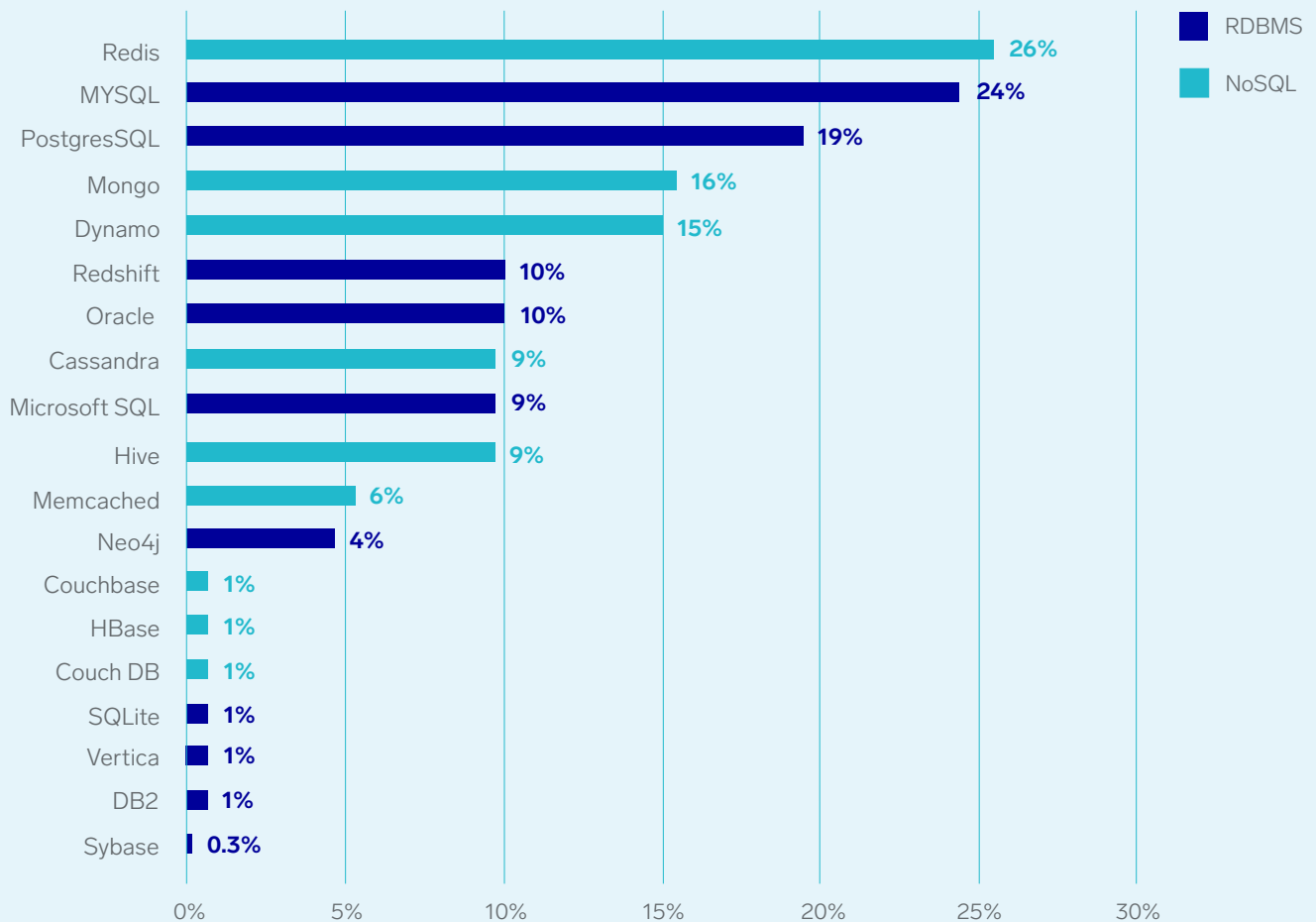
* MySQL is available in multiple forms in AWS (native or RDS source).

Findings

- Redis is the #1 database in AWS.
- Microsoft SQL and OracleDB significantly lag in terms of usage in AWS.

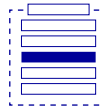
Prioritize and evaluate the top 5 technologies - Redis, MySQL, PostgreSQL, MongoDB, and Dynamo as you consider your database choices.

Database technology usage in AWS



*Some customers use multiple databases

NGINX and Apache are the web servers of choice on AWS



Context

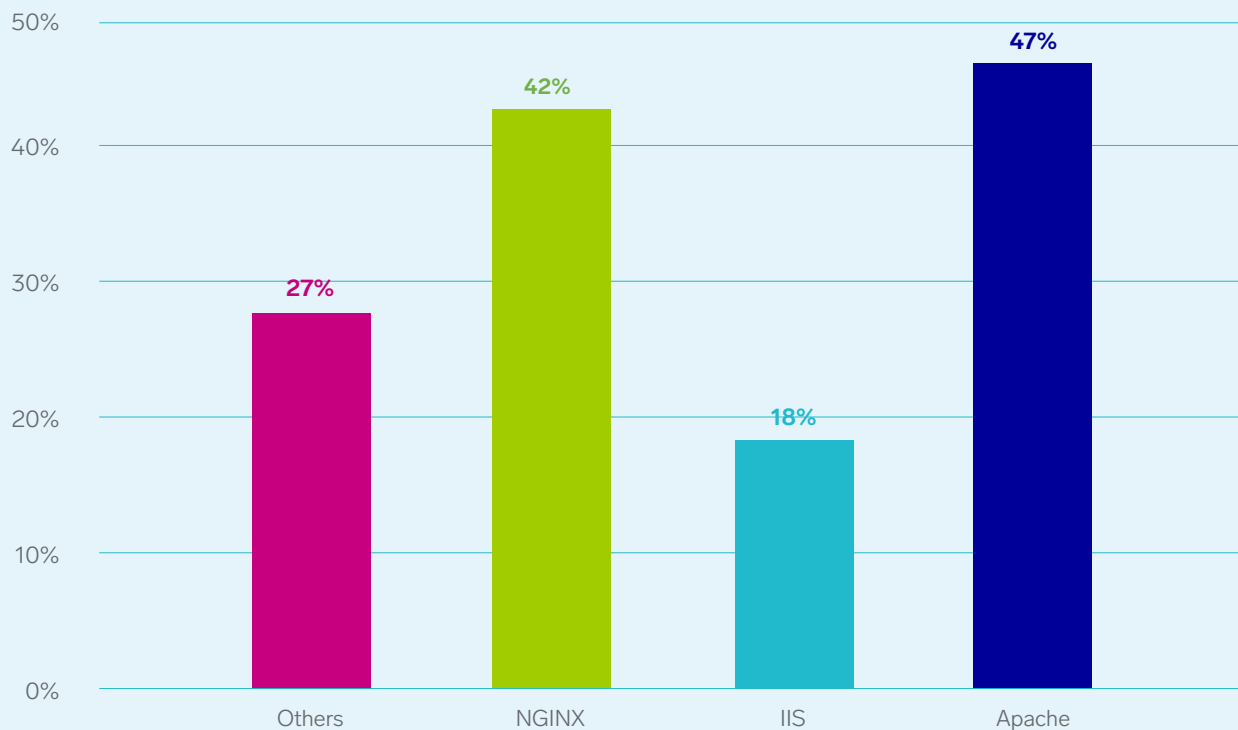
- Web servers are a foundational building block for modern applications.

Evaluate NGINX and Apache as your web server platform when building or migrating applications to AWS.

Findings

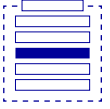
- Apache is the leading AWS web server.
- Apache and NGINX are used in 3 out of 4 AWS-based applications.

Web server technology usage in AWS*



*Some customers use multiple web servers

IIS and Apache are the web servers of choice in Azure



Context

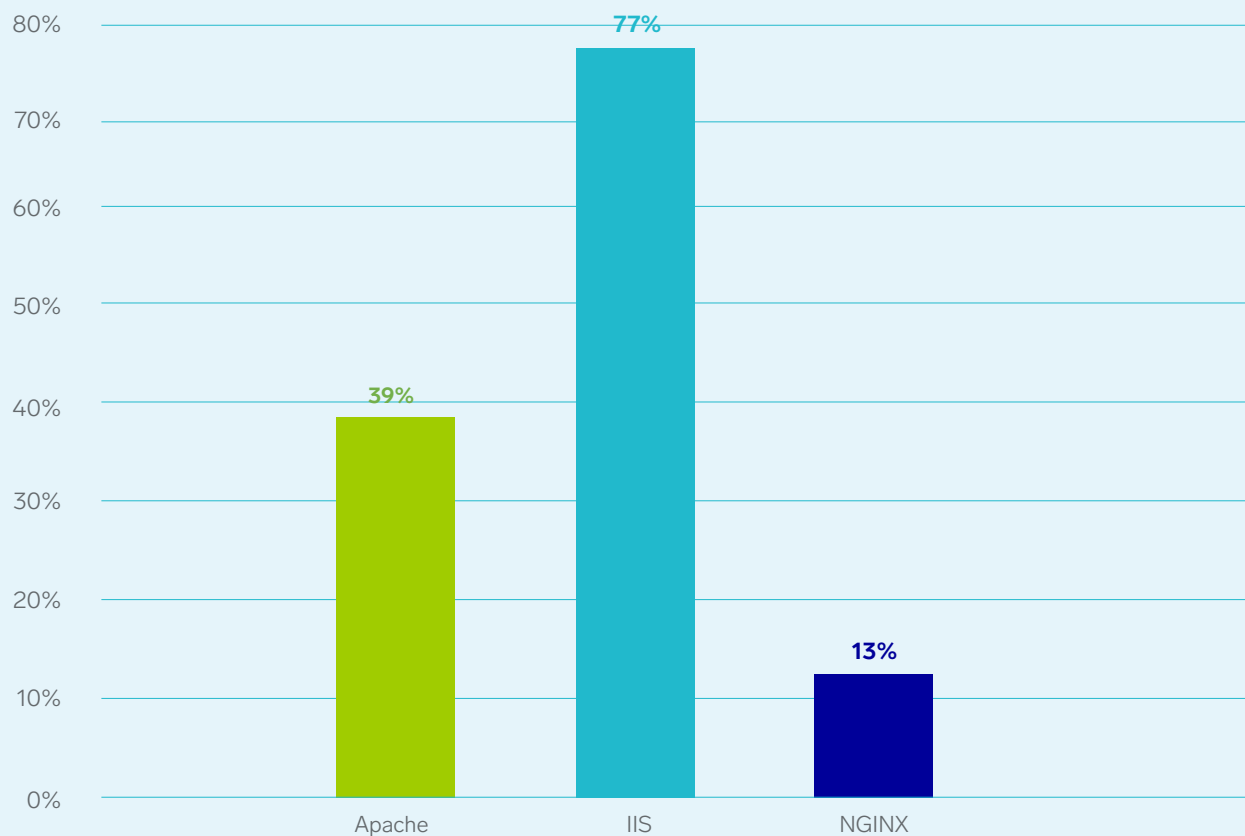
- Web servers are a foundational building block for modern applications.

If you are building applications in Azure, consider IIS and Apache as your web server technologies.

Findings

- IIS is the leading Azure web server.
- Apache is also used by many Azure customers.

Web server technology usage in Azure*



*Some customers use multiple web servers

Serverless technology adoption continues to rise



Context

- AWS Lambda lets IT teams run code without requiring them to provision or manage server infrastructure.

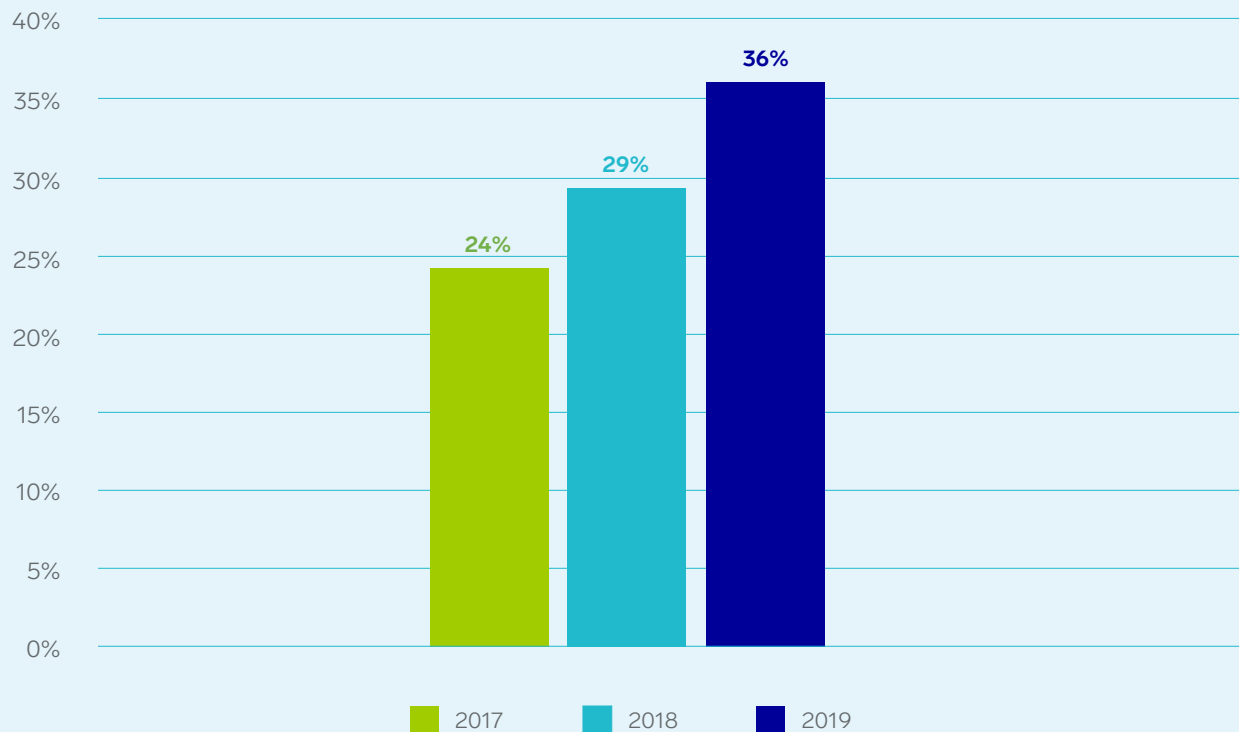
Findings

- AWS Lambda adoption has grown dramatically from 29% (2018) to 36% (2019).
- Many of the initial use cases for AWS Lambda are focused on cloud/DevOps deployment and automation.

Lambda usage for application or deployment automation technology should be considered for every production application.

Consider using Serverless for ephemeral tasks – production and non-production.

Lambda adoption in AWS



Amazon CloudFront is the leading CDN service in AWS



Context

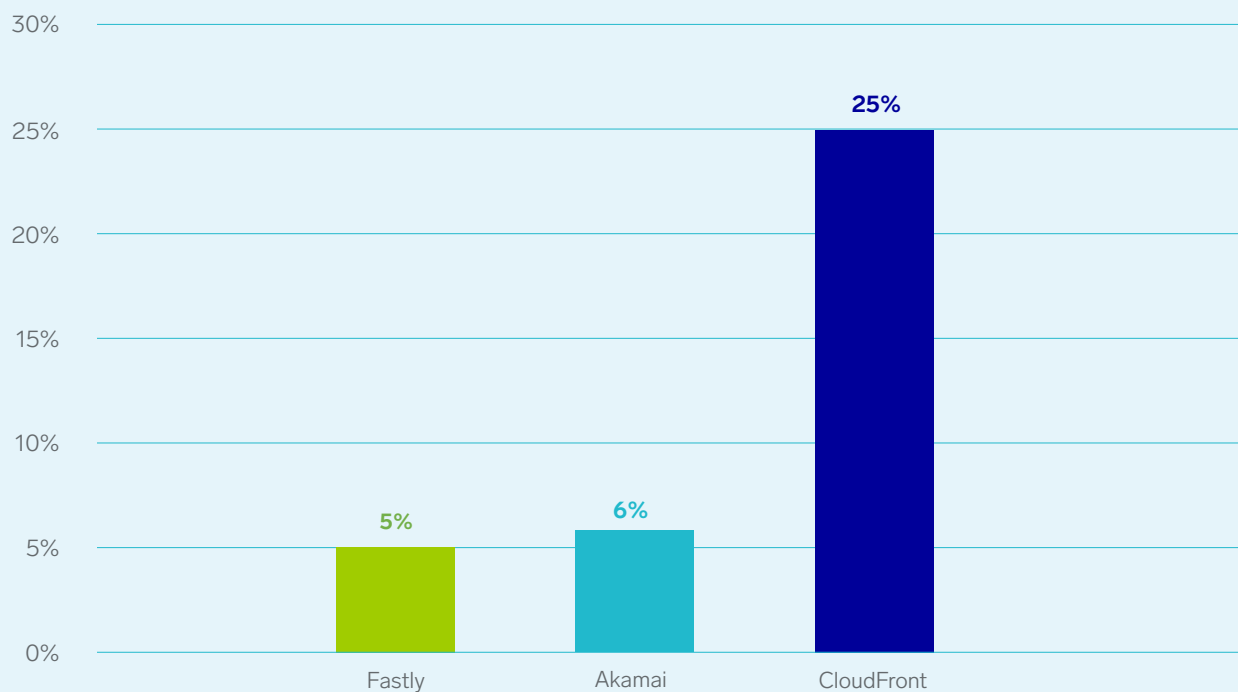
- A content delivery network (CDN) is critical to delivering great application performance.
- Amazon CloudFront is an AWS-native (CDN) service.
- Akamai and Fastly provide third-party CDN services to AWS customers.

Consider cost, capabilities and global reach when evaluating your CDN choices to improve modern application delivery.

Findings

- As customer experience grows in importance, many enterprises are adopting CDNs to improve application and content performance.
- AWS-native CDN (CloudFront) is the clear leader in AWS.
- Fastly, a relatively new CDN vendor is experiencing similar adoption as Akamai, the global leader.

CDN adoption in AWS



Enterprises use commercial technologies to monitor and troubleshoot their production CI/CD pipelines



Context

- DevOps adopters also monitor their continuous integration & continuous delivery (CI/CD) processes and tools to improve application agility and reliability.
- DevSecOps shifts security workflows left into the development process. Hence a unified analytics platform is required for both DevOps and SOC teams to deliver digital services with high quality and acceptable secure posture.

- Many Sumo Logic customers monitor and troubleshoot their source code repository, build/CI, artifact repository, test (staticcode analysis, unit/functional test), CD/pipeline automation and release automation tools with Sumo Logic's real-time, Continuous Intelligence Platform.

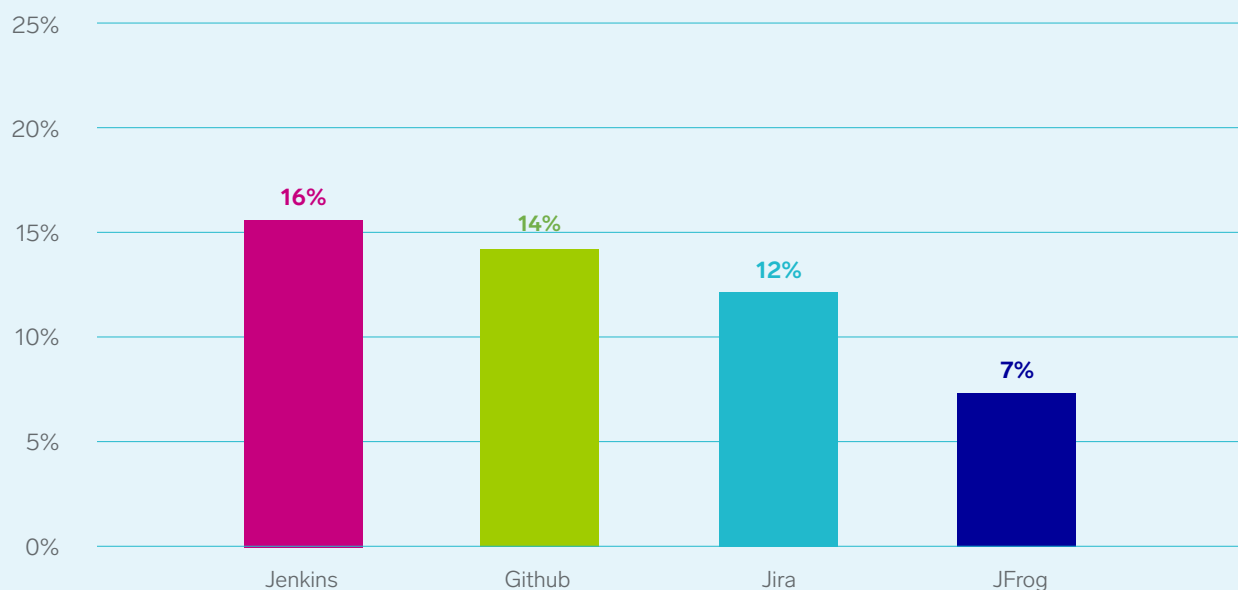
Findings

- Real-time, machine data analytics is a common method to monitor and obtain visibility into your development/release processes, and is critical to serve many development personas (developers, testers, release engineers and executives).

The software development process is critical to track and improve enterprise agility.

Monitor your entire development pipeline (from code to release) to measure, baseline and improve your development process.

Top DevOps tools monitored by Sumo Logic



AWS customers are using many services/ technologies to improve application security



Context

- Security is a top concern for any enterprise moving to the public cloud.
- AWS offers several “native” application security services.
- AWS CloudTrail provides a record trail of AWS calls for audit and reporting.
- AWS VPC and VPC Flow Logs enable customers to create secure virtual private networks and audit network traffic to these networks.
- Amazon GuardDuty is a threat detection service that continuously monitors for malicious or unauthorized behavior to help you protect your AWS accounts and workloads.

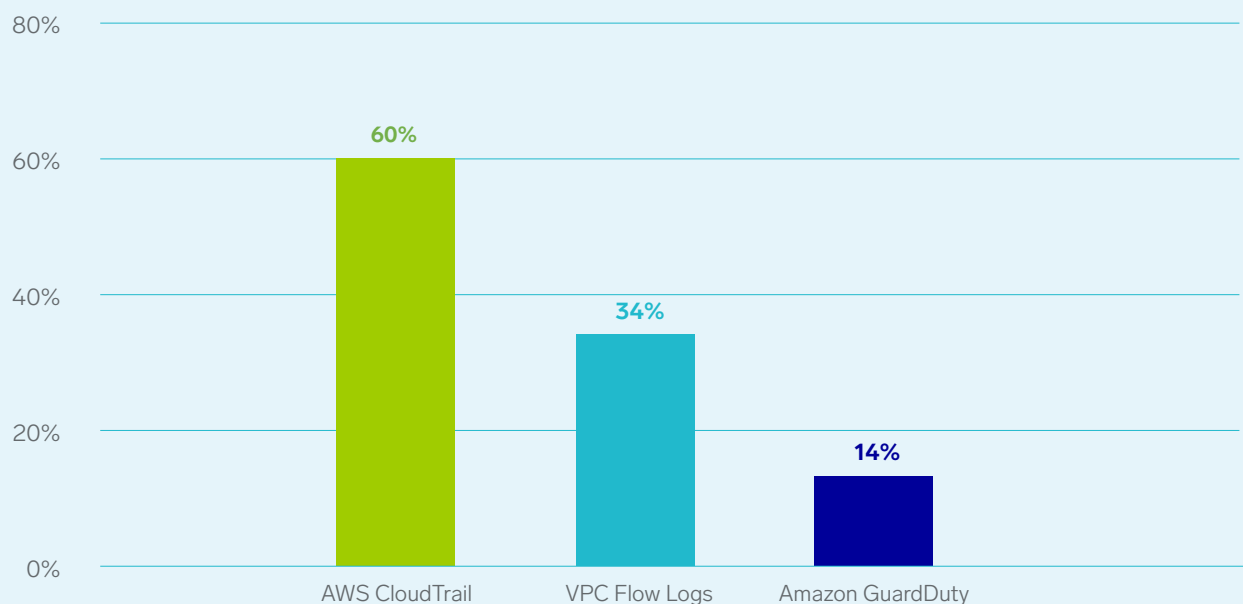
Findings

- More than 50% of AWS applications are using the primary and mature AWS audit service, CloudTrail.
- To provide additional security, AWS customers should also implement virtual private networks and analyze VPC Flow Logs.

When moving to the cloud, enterprises should take the time to review security posture and controls.

Enterprises must leverage table stakes services like AWS CloudTrail and VPC Flow Logs to ensure security in AWS environments.

Security services adoption in AWS



Adoption of threat intelligence services increases



Context

- Threat intelligence is evidence-based knowledge, including context, mechanisms, indicators of existing or emerging security attacks or hazards.
- Amazon GuardDuty is a threat detection service that continuously monitors for malicious or unauthorized behavior to help you protect your AWS accounts and workloads.
- Many commercial threat intelligence services (such as CrowdStrike) provide crowd-sourced and proprietary visibility into security threats.

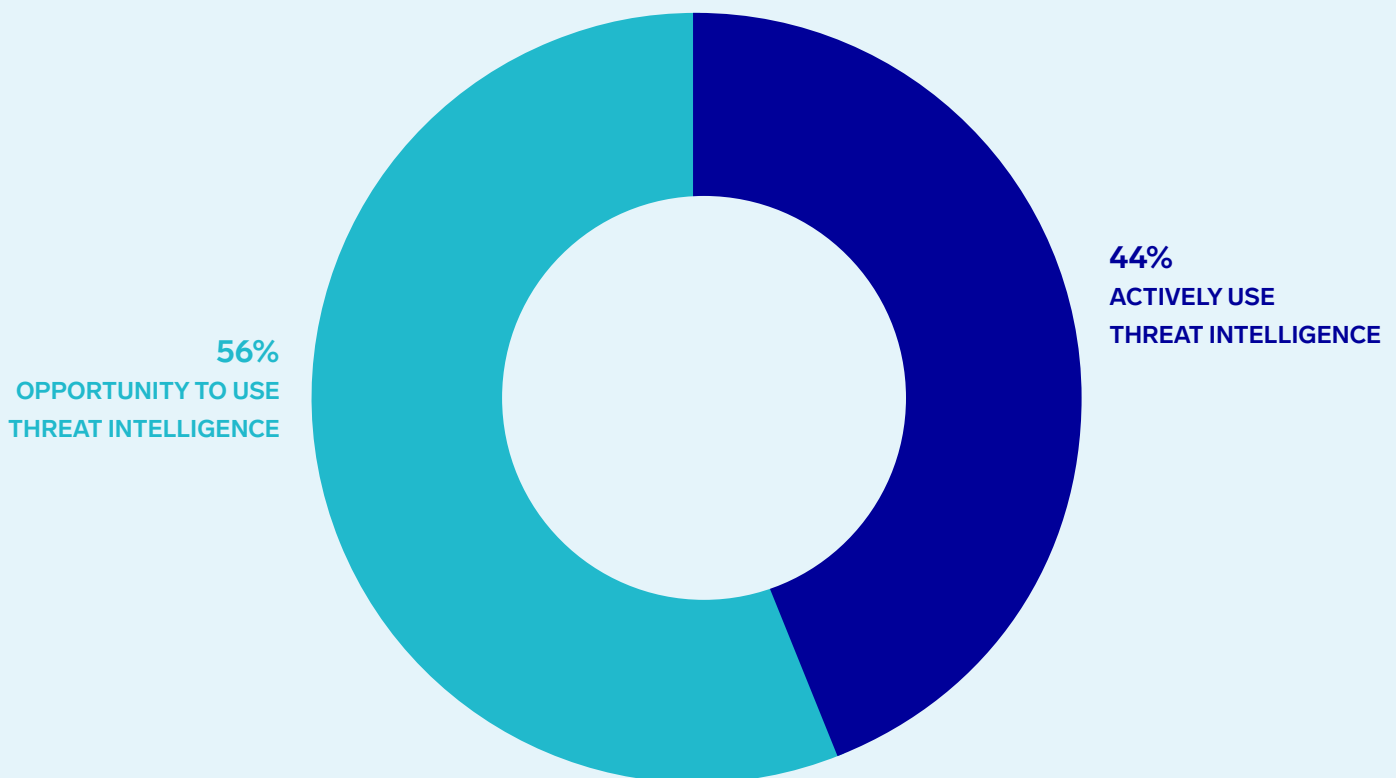
Organizations are under increasing pressure to manage security vulnerabilities, and the threat landscape is constantly evolving.

Enterprises should consider using threat intelligence services to stay current with existing or emerging security threats.

Findings

- Nearly half of all enterprises use some kind of threat intelligence service.

AWS customers who use threat intelligence service



Security vendors are addressing growing cloud security use cases with varied success



Context

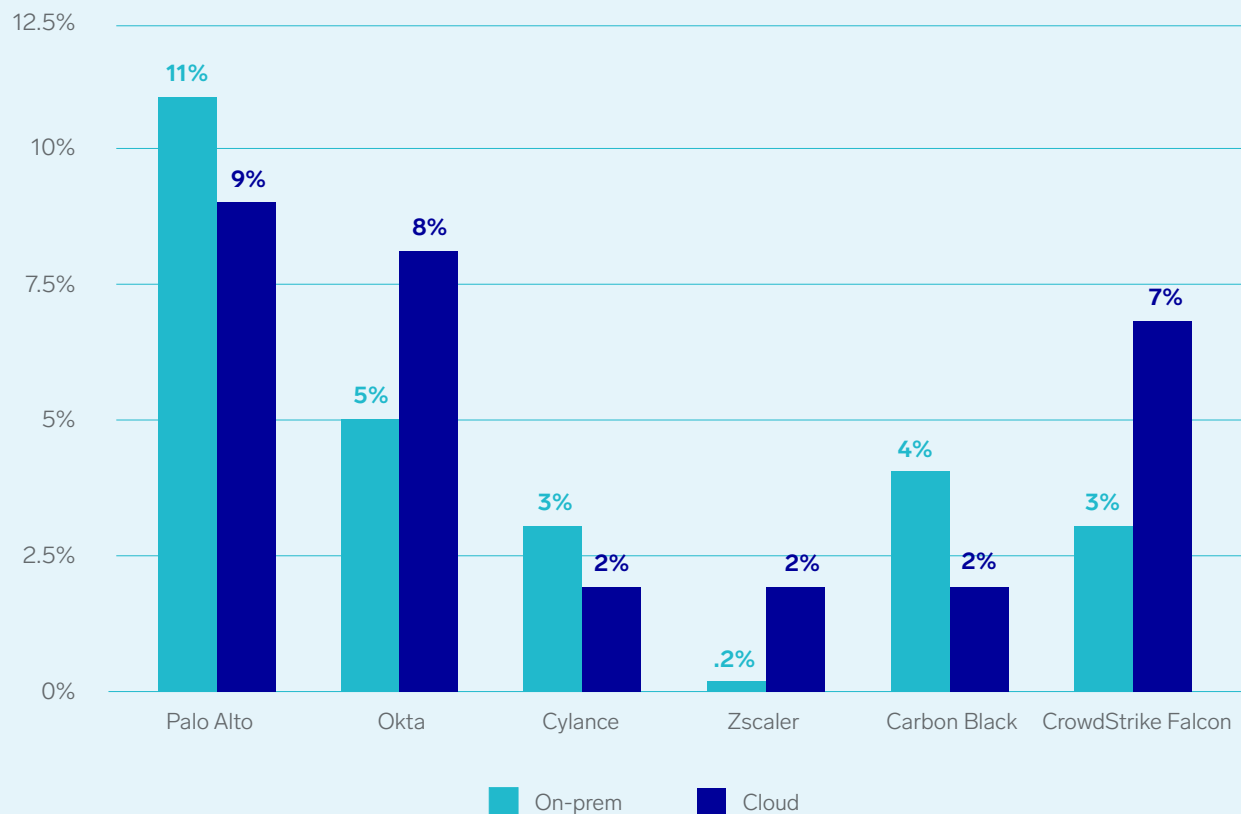
- Cloud security is different from on-prem security.
- Important dimensions to consider include supported technologies, threat surface areas and delivery model

Consider cloud-first security vendors as you evaluate third-party cloud security solutions.

Findings

- Cloud-native vendors, are showing higher penetration into enterprises leveraging cloud than enterprises running on-prem.
- Some, but not all, traditionally on-prem vendors are making strong push into the cloud while other traditionally on-prem vendors are not adjusting to capitalize on cloud security opportunities.

Adoption of security tools integrated into Sumo Logic



About Sumo Logic

Enterprises rely on Sumo Logic to build, run and secure their modern applications

2000+ Customers

Massive scale on AWS

Data analyzed daily

**100+
PB**

Searches performed daily

**30+
Million**

Records queried daily

**500+
Trillion**

Sumo Logic is a secure, cloud-native, Continuous Intelligence Platform for DevSecOps delivering real-time, continuous intelligence across the entire application lifecycle and stack. Nearly 2,000 customers around the globe rely on Sumo Logic for the analytics and insights to build, run and secure their modern applications and cloud infrastructures.

Learn more at www.sumologic.com

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Toll-Free: 1.855.LOG.SUMO | Int'l: 1.650.810.8700
305 Main Street, Redwood City, CA 94603

www.sumologic.com