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The State of Modern Applications & DevSecOps in the Cloud

Powered by Sumo Logic

Third Annual Report, 2018 Edition

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sumo logic

The Rise of Modern Applications and DevSecOps

Sumo Logic Machine Data Analytics Platform

Sumo Logic is a secure, cloud-native, machine data analytics service, delivering real-time, continuous intelligence across the entire application lifecycle and stack. More than 1,600 customers around the globe rely on Sumo Logic for the analytics and insights to build, run and secure their modern applications and cloud infrastructures.

For the past two years, Sumo Logic has produced the **first and only** industry report that quantitatively defines the state of the Modern

App Stack. Working with our customers, we continue to see rapid advances in tools and processes used by various enterprise personas to build, run and secure modern applications. This third annual report extends our analysis to DevSecOps, a new and innovative trend that is rapidly growing amongst our customers.

New Trends in App Architectures, Processes, Tools and Use Cases

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

Rise of Modern Applications

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

Rapid Adoption of DevSecOps

Many enterprises who build apps in the cloud 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 machine data analytics platform. Enterprises are utilizing platforms like Sumo Logic to automate and monitor their end-to-end app lifecycle (Dev → Operate → Secure) processes.
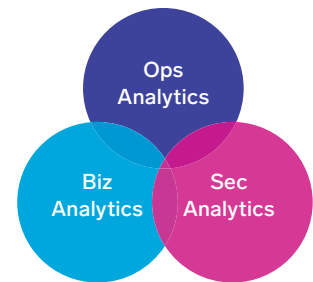
Relevance of Machine Data Analytics

Machine data analytics can provide many mission-critical values for customers. Enterprises can manage the operations, ensure app security and compliance, and get unique business insights into app users and usage.

The Rise of Modern Applications and DevSecOps

Why is Sumo Logic uniquely positioned to create this report?

For over eight years, Sumo Logic has provided the leading cloud-native, machine data analytics platform that now analyzes 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, 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 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, Operations, 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 1600+ Sumo Logic customers running applications on cloud platforms like AWS, Azure, Google Cloud, etc. All customer specific 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 analytics service runs on AWS. The experience and expertise of running this mission critical and massive service is also leveraged in this report.

This report assumes that an app 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

16%
OTHERS

9%
MULTI-CLOUD

5%
AZURE

70%
AWS
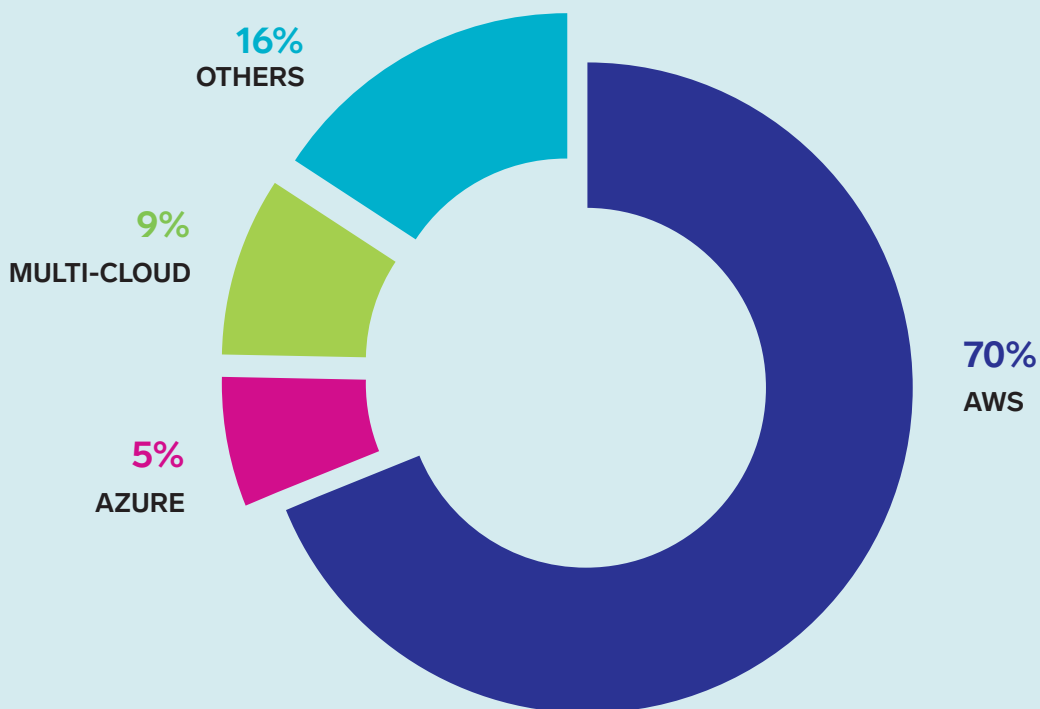
Key Takeaways

1 Multi-cloud adoption and deployments have doubled. AWS dominates, while Azure adoption has doubled, and interest in GCP grows.

2 Adoption of serverless architectures continues to grow; 1 in 3 enterprises use AWS Lambda technologies.

3 Orchestration and container adoption are exploding; 1 in 3 enterprises use managed or native Kubernetes orchestration solutions and 28% enterprises use Docker containers in AWS.

4 Security is still a major focus area for enterprises adopting cloud or migrating/modernizing existing traditional applications.

Adoption of next-gen and cloud-hosted security technologies (Okta, Cylance, Palo Alto Networks) has doubled; more than 1 in 4 enterprises are adopting a combination of cloud-native platform security services (CloudTrail, VPC Flow Logs, GuardDuty, etc.)

5 DevSecOps adoption is increasing. To improve software agility, reliability and security, enterprises are actively monitoring and analyzing their end-to-end tools and processes across the lifecycle with machine data analytics solutions.
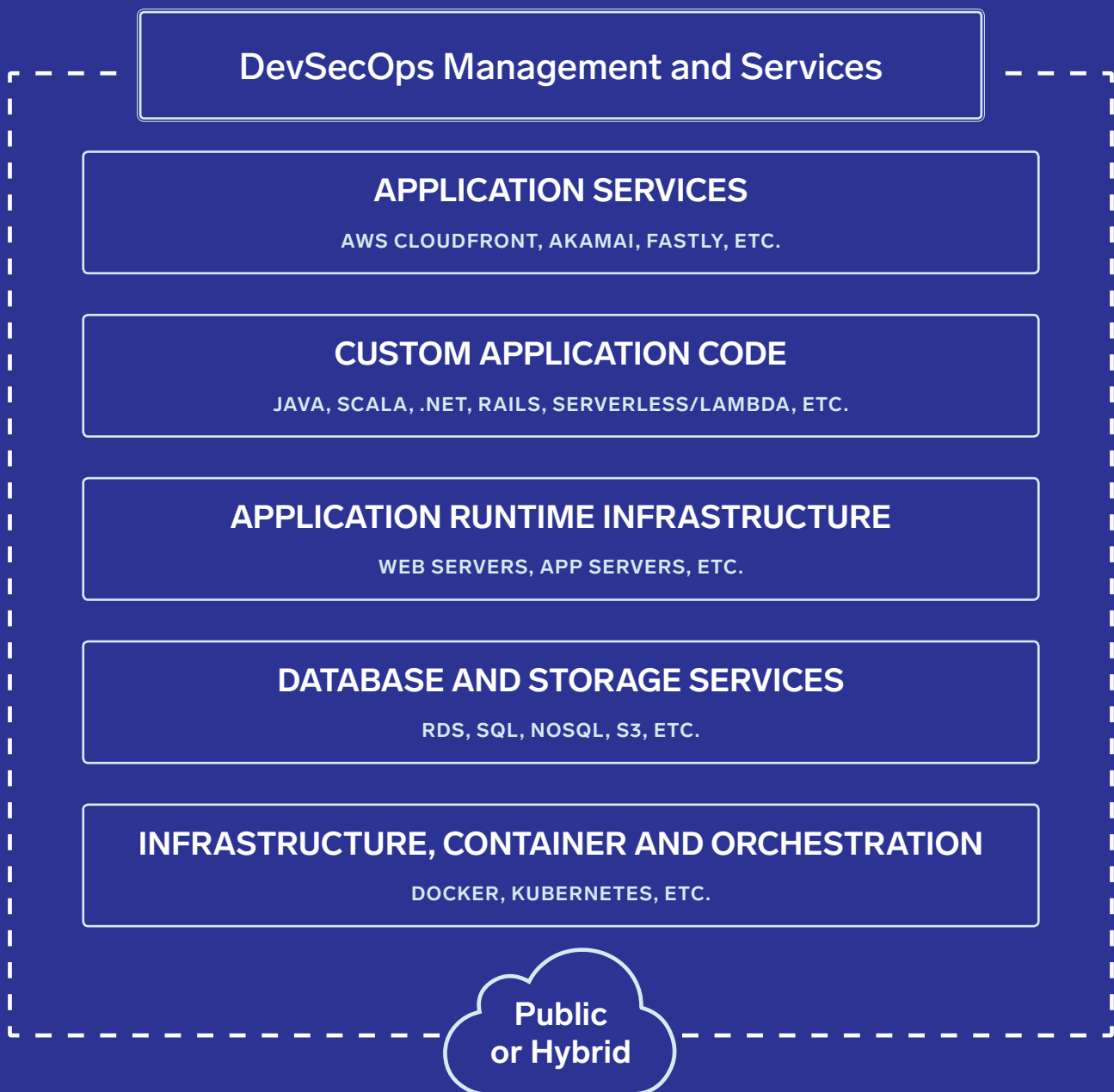
The Modern Application Stack

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

New tiers that make up the modern application stack

New technologies that are emerging as leaders within these tiers

New services that enable application operations and security management

DevSecOps Management and Services

APPLICATION SERVICES

AWS CLOUDFRONT, AKAMAI, FASTLY, ETC.

CUSTOM APPLICATION CODE

JAVA, SCALA, .NET, RAILS, SERVERLESS/LAMBDA, ETC.

APPLICATION RUNTIME INFRASTRUCTURE

WEB SERVERS, APP SERVERS, ETC.

DATABASE AND STORAGE SERVICES

RDS, SQL, NOSQL, S3, ETC.

INFRASTRUCTURE, CONTAINER AND ORCHESTRATION

DOCKER, KUBERNETES, ETC.

Public or Hybrid

Docker Adoption Gains Speed in AWS

Context

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

Findings

- Docker is a relatively new technology; yet we are seeing dramatic year over year growth for Docker (24% → 28%)
- Significant adoption of Docker also implies growing use of microservices-based applications

With 28% of enterprises using Docker, it's clear that Docker is a critical foundational layer for modern applications

Docker Adoption in AWS

30%

28%

25%

24%

20%

18%

15%

10%

5%

0%

2016   2017   2018
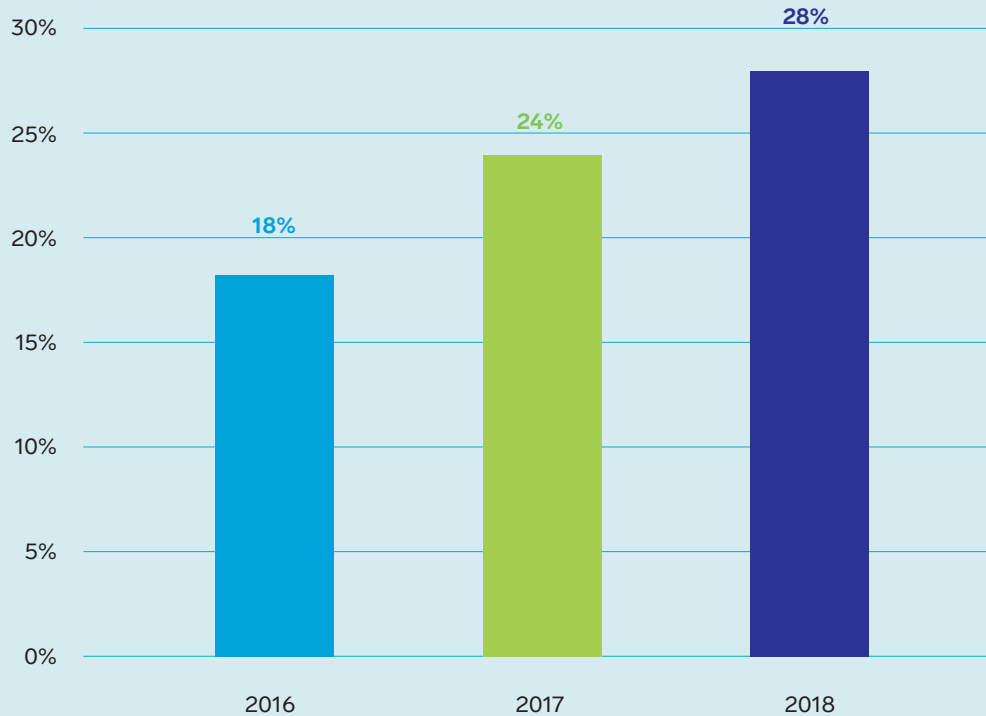
DOCKER USAGE IN PRODUCTION

# Orchestration is Fast Becoming a Requirement for Container Management

Context

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

Findings

- 1 in 3 AWS customers is using orchestration
- ECS has wide adoption in AWS; Kubernetes is catching up.
- Many enterprises are also considering orchestration as a way to deploy/manage multi-cloud applications

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

AWS Customers using Orchestration

	2017	2018	2017	2018
	14%	20%	8%	14%

ECS   **NATIVE KUBERNETES**
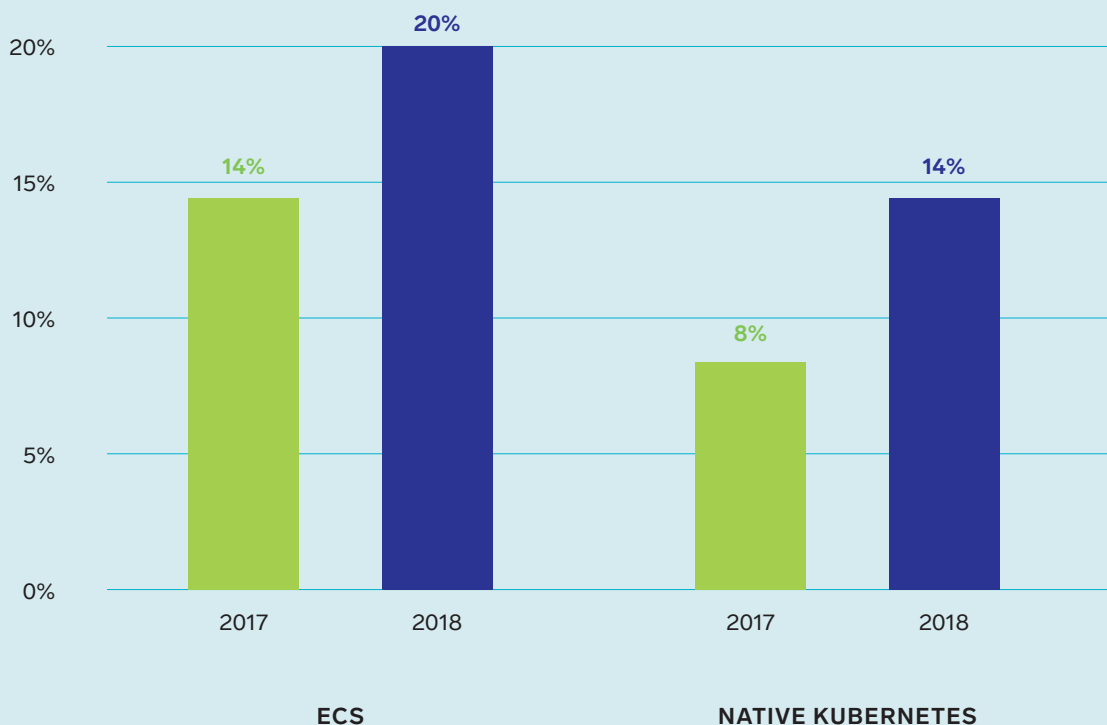
NoSQL Leads RDBMS Database Adoption

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.

Findings

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

Cloud migration is providing the opportunity to make an optimal choice of back-end data stores and optimize for the right application use cases

Database Adoption in AWS

NOSQL **45%**

RDBMS **39%**

0%   10%   20%   30%   40%   50%

Some customers use multiple databases

3 Out of 5 Top Databases in AWS are NoSQL

Context

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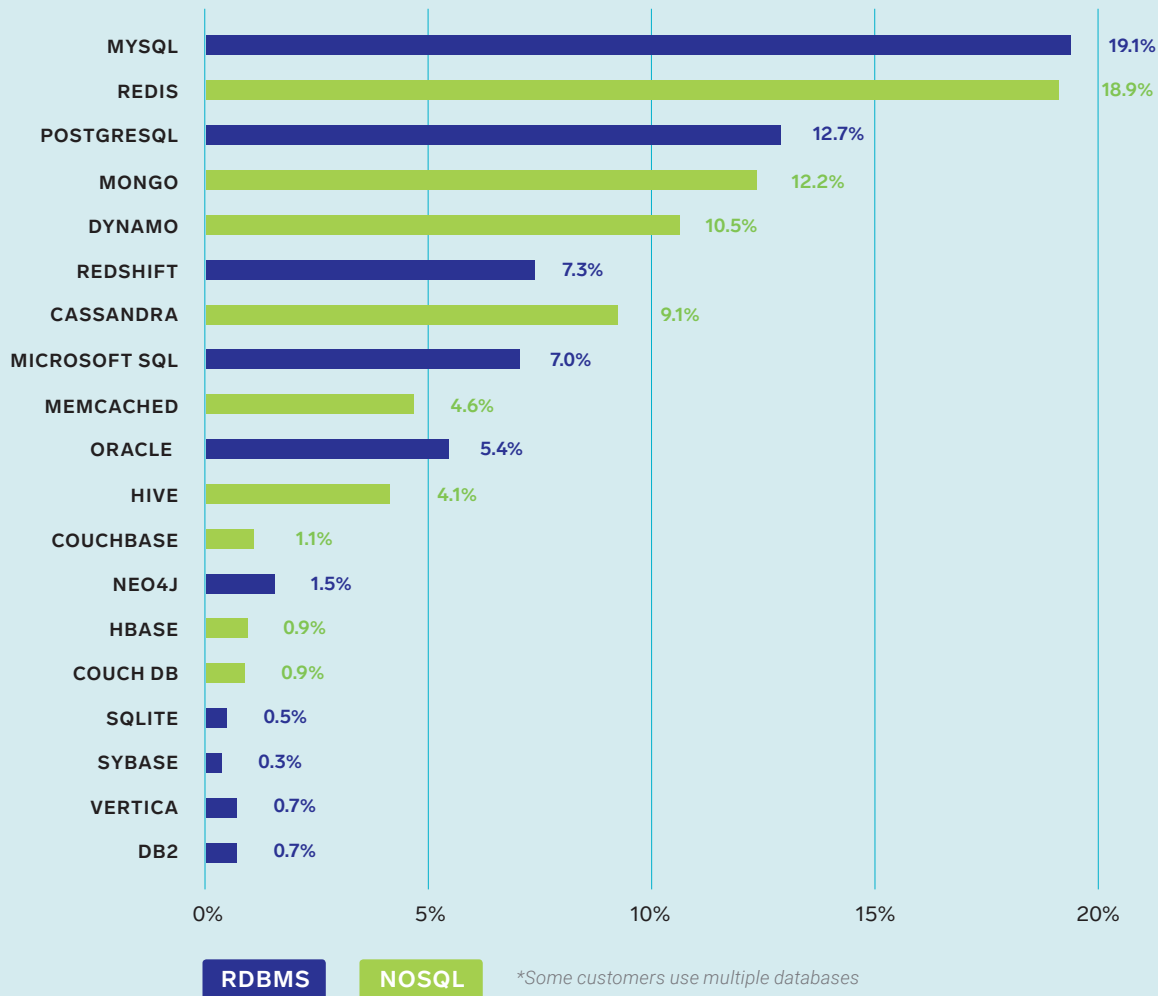
Findings

- MySQL is the #1 database in AWS
- MySQL, Redis and MongoDB are the leading databases in AWS
- Microsoft SQL and Oracle DB significantly lag in terms of usage in AWS

Prioritize and evaluate MySQL (relational), Redis (in-memory) or MongoDB (NoSQL) as you consider your database choices

* MySQL is available in native or AWS (RDS or Aurora)
* PostGresSQL is available in native or AWS (Aurora)

Database Technology Usage in AWS

Database	Usage
MYSQL	19.1%
REDIS	18.9%
POSTGRESQL	12.7%
MONGO	12.2%
DYNAMO	10.5%
REDSHIFT	7.3%
CASSANDRA	9.1%
MICROSOFT SQL	7.0%
MEMCACHED	4.6%
ORACLE	5.4%
HIVE	4.1%
COUCHBASE	1.1%
NEO4J	1.5%
HBASE	0.9%
COUCH DB	0.9%
SQLITE	0.5%
SYBASE	0.3%
VERTICA	0.7%
DB2	0.7%

RDBMS   NOSQL   *Some customers use multiple databases*

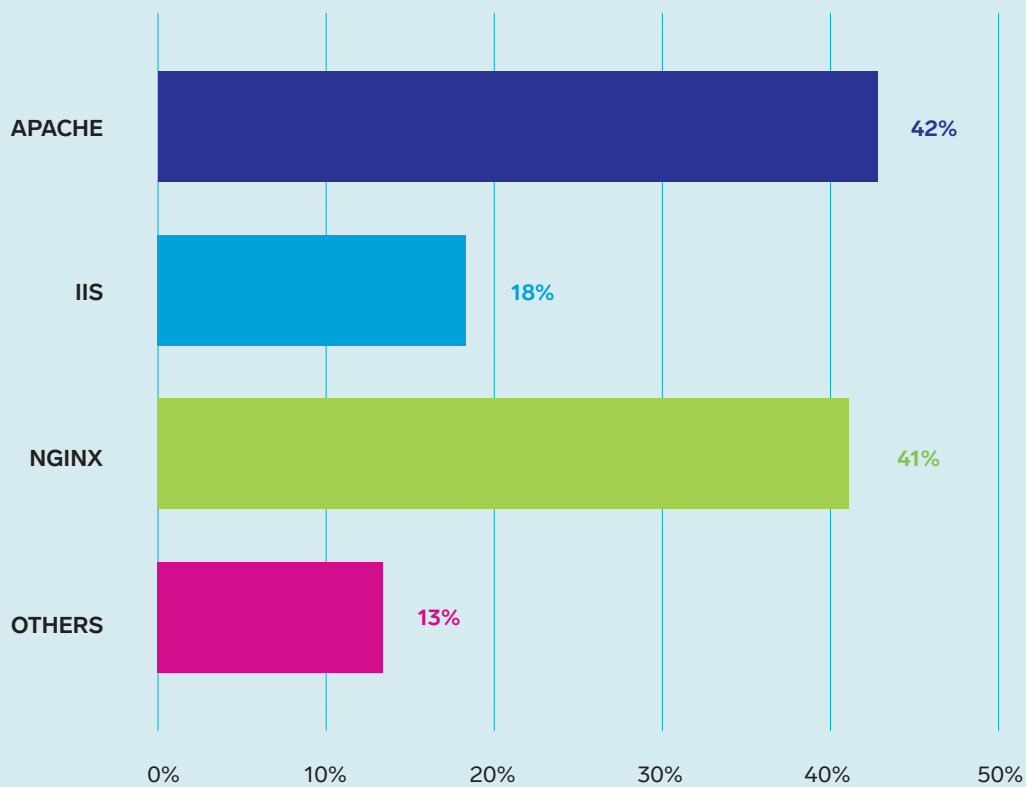# Apache and NGINX are the Web Servers of Choice on AWS

Context

- Web servers are a foundational building block for modern applications

Findings

- Apache is the leading AWS web server
- Apache and NGINX are used in most AWS based applications

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

Web Server Techology Usage in AWS

Server	Usage
APACHE	42%
IIS	18%
NGINX	41%
OTHERS	13%

Some customers use multiple web servers

IIS is the Web Server of Choice on Azure

Context

• Web servers are a foundational building block for modern applications

Findings

• IIS is the leading Azure Web server

• Apache is also used by many Azure customers

If you are building apps in Azure, consider IIS or Apache as your web server technologies

Web Server Technology Usage in Azure

APACHE 24%

IIS 55%

NGINX 10%

0%   10%   20%   30%   40%   50%   60%

Some customers use multiple web servers

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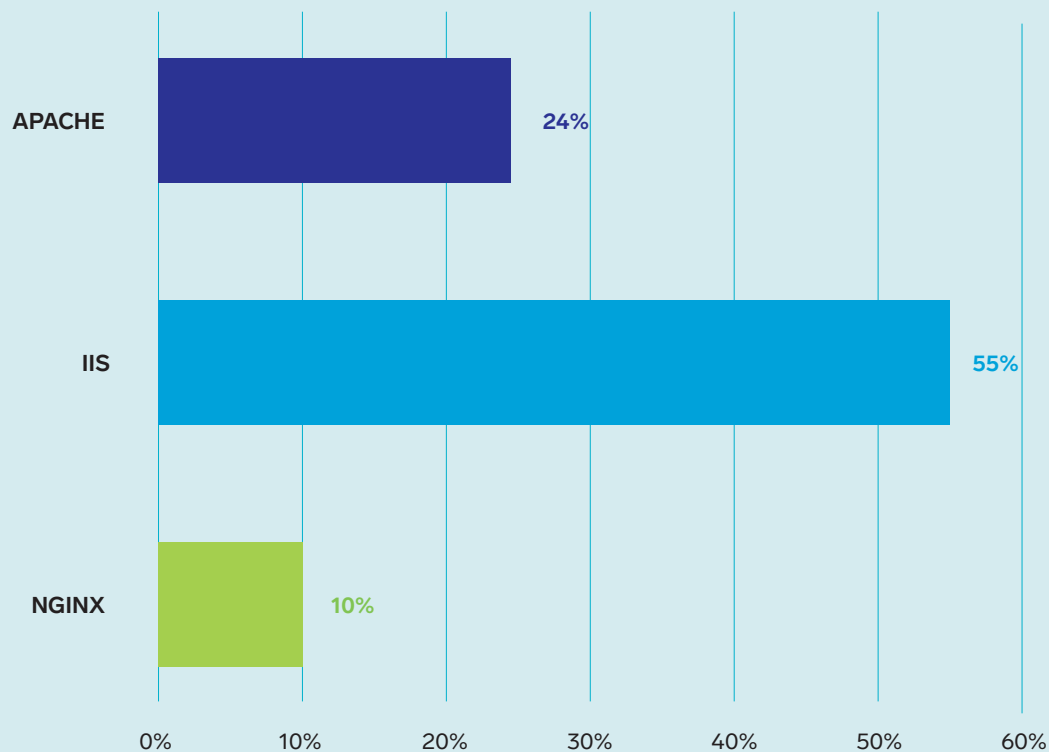
Serverless Technology Adoption Continues to Rise
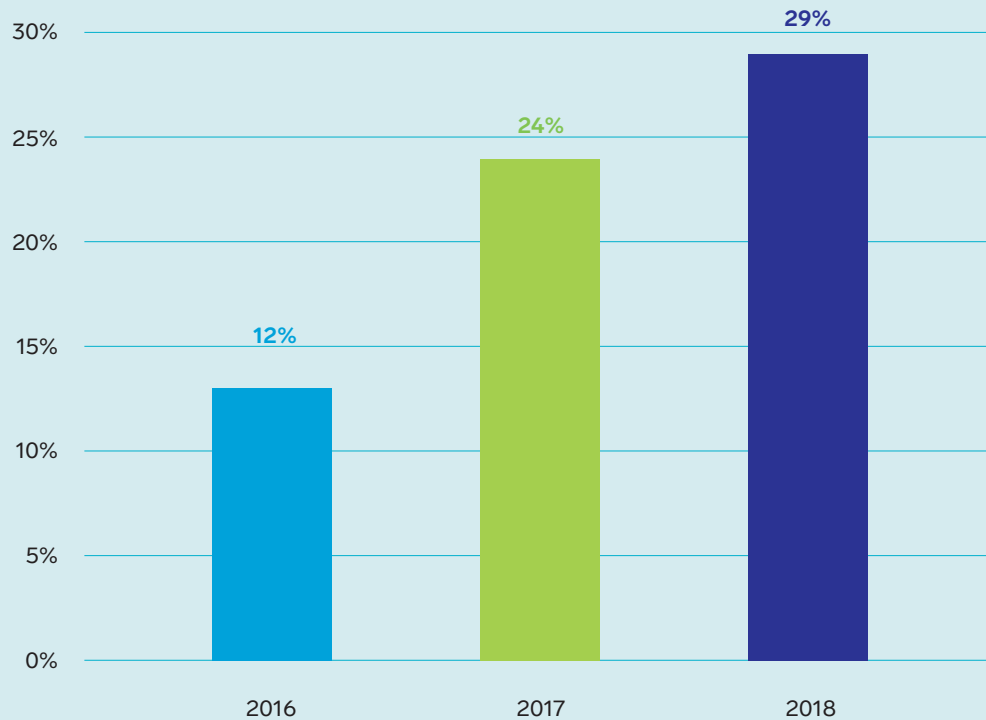
Context

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

Findings

- AWS Lambda adoption has grown dramatically from 24% (2017) to 29% (2018)
- 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

Lambda Production Usage in AWS

Year	Usage
2016	12%
2017	24%
2018	29%

LAMBDA USAGE IN PRODUCTION

# CloudFront Leads as the AWS Application Service CDN

Context

- Content Delivery Network (CDN) is critical to deliver great application performance
- Amazon CloudFront is an AWS-native CDN service
- Akamai and Fastly provide third-party CDN services to AWS customers

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

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

CDN Adoption in AWS

AKAMAI	6%
CLOUDFRONT	24%
FASTLY	4%

0% 5% 10% 15% 20% 25%
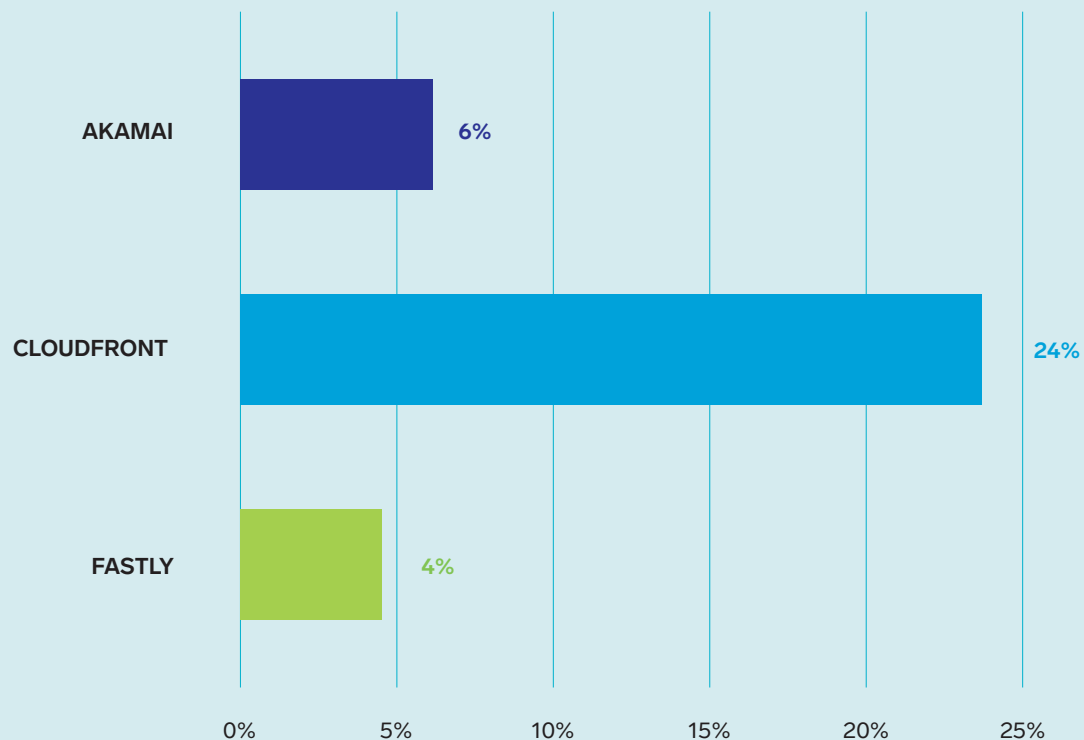
Customers Adopting DevOps/DevSecOps are also Monitoring Their CI/CD Pipeline
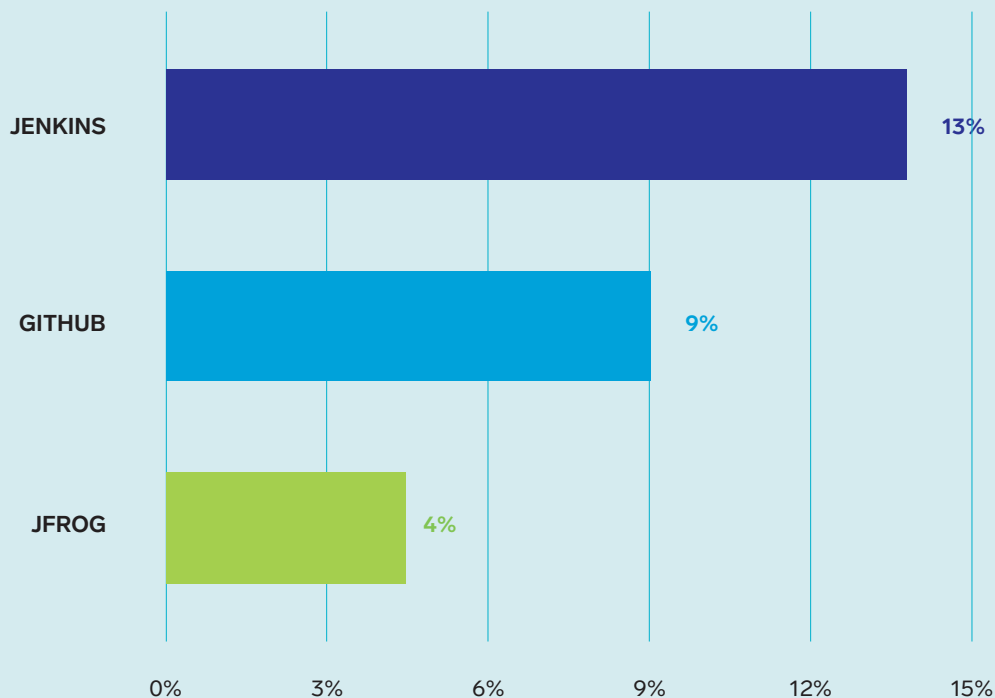
Context

- As customers adopt DevOps, they also monitor their CI/CD process and tools to improve application agility and reliability
- DevSecOps shifts left security workflows and requires common analytics platform for both DevOps and SOC teams

Findings

- 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)
- Many Sumo Logic customers monitor and troubleshoot their source code repository, artifact repository, build/CI, test (static code analysis, unit/functional test), CD/pipeline automation and release automation tools with Sumo Logic's machine data analytics service

Monitor your entire Dev pipeline (from code to release) with machine data analytics solutions to improve your Dev/Release processes

DevOps Tools Monitored by Sumo Logic

Tool	Percentage
JENKINS	13%
GITHUB	9%
JFROG	4%

# Customers Use Many Services to Improve Application Security

Context
- Security is a top concern for any enterprise moving to 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

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

> Use AWS CloudTrail and VPC Flow Logs to improve application and infrastructure security; multi-cloud enterprises should also consider native tools from Azure and GCP

Security Services Adoption in AWS

CLOUDTRAIL	56%
VPC FLOWLOGS	29%

0% 10% 20% 30% 40% 50% 60%
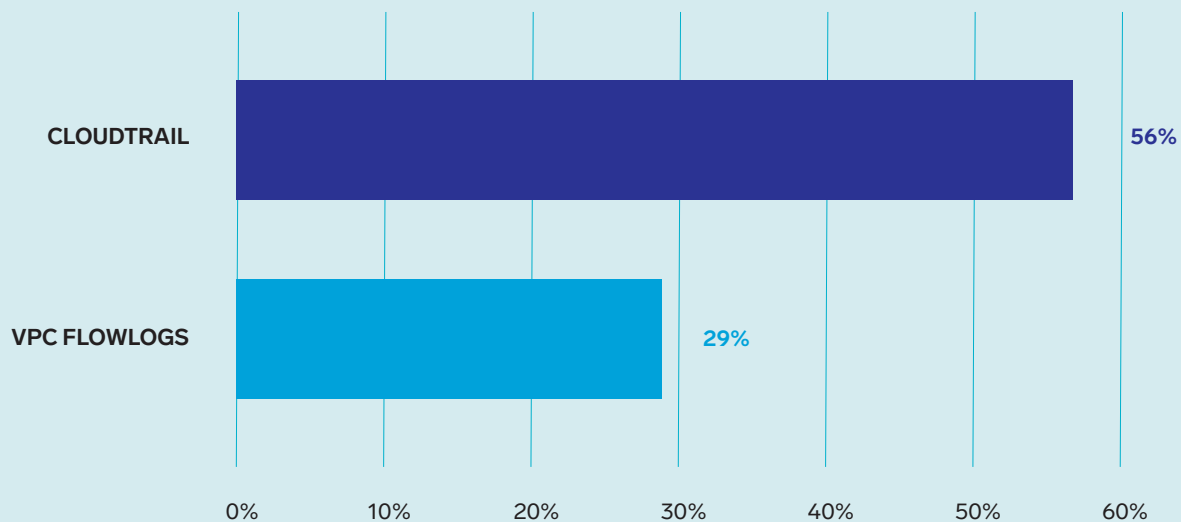
# Adoption of Threat Intelligence Services Increases

Context

- Threat intelligence is evidence-based knowledge, including context, mechanisms, indicators of existing or emerging sercurity attacks or hazards
- AWS 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 provide crowd-sourced and proprietary visibility into security threats

Findings

- Almost 1 in 4 enterprises uses some kind of cloud-native or commercial Threat Intelligence service

Consider using Threat Intelligence services to stay current with existing or emerging security threats

Threat Intelligence Services Adoption in AWS

AWS GUARDDUTY **10%**

SUMO LOGIC
THREAT INTELLIGENCE **17%**

0%   5%   10%   15%   20%
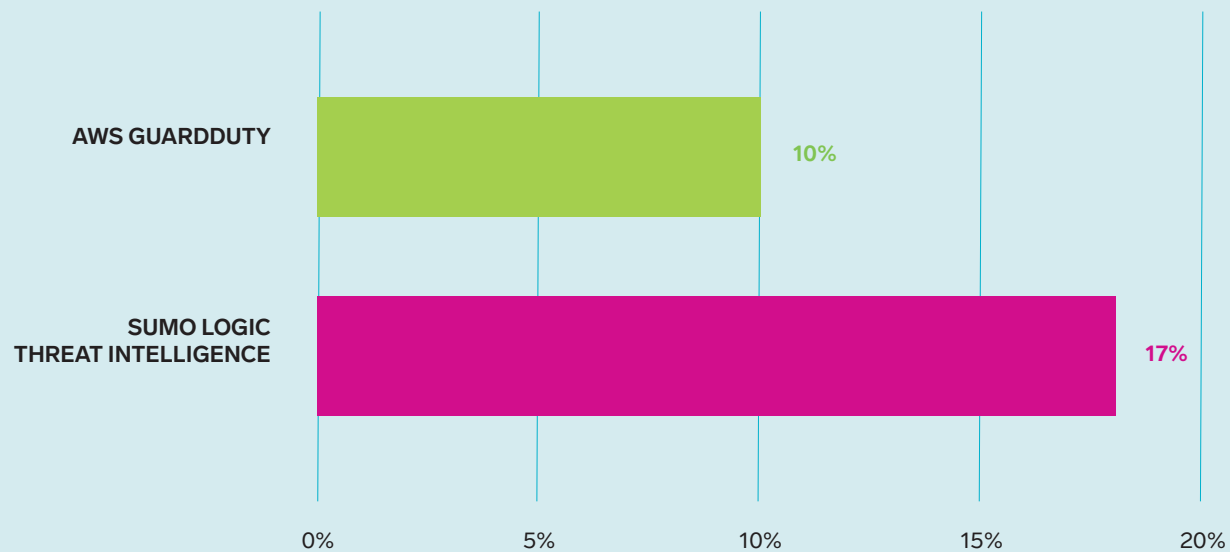
Sumo Logic threat intelligence is powered by Crowdstrike

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Rapidly Growing Next-Gen Cloud Security Tools Addresses Critical Gaps, but Integration of Data and Workflow Across These Tools is Needed

Context

- New/evolving tools provide security analytics for portions of the cloud and application stacks, but the integration across these tools can be overwhelming for SecOps
- Traditional SIEMs, the natural candidates to integrate security correlation and monitoring across the enterprise, are failing to adapt to the emerging cloud and application stacks

Findings

- Digital transformation initiatives, cloud environments and modern applications have dramatically increased security threat surface areas
- Adoption of next-gen and cloud-hosted security technologies (Okta, Cylance, Palo Alto Networks, etc.) have more than doubled in cloud environments

To support DevSecOps, invest in solutions that democratize security across both SecOps and IT Ops/ DevOps disciplines; invest in highly scalable security analytics that can support on-prem and cloud apps and infrastructure

Growth in Security Tools Integrated into Sumo Logic

PALO ALTO NETWORKS	78%
OKTA	150%
CYLANCE	160%

0% 50% 100% 150% 200%
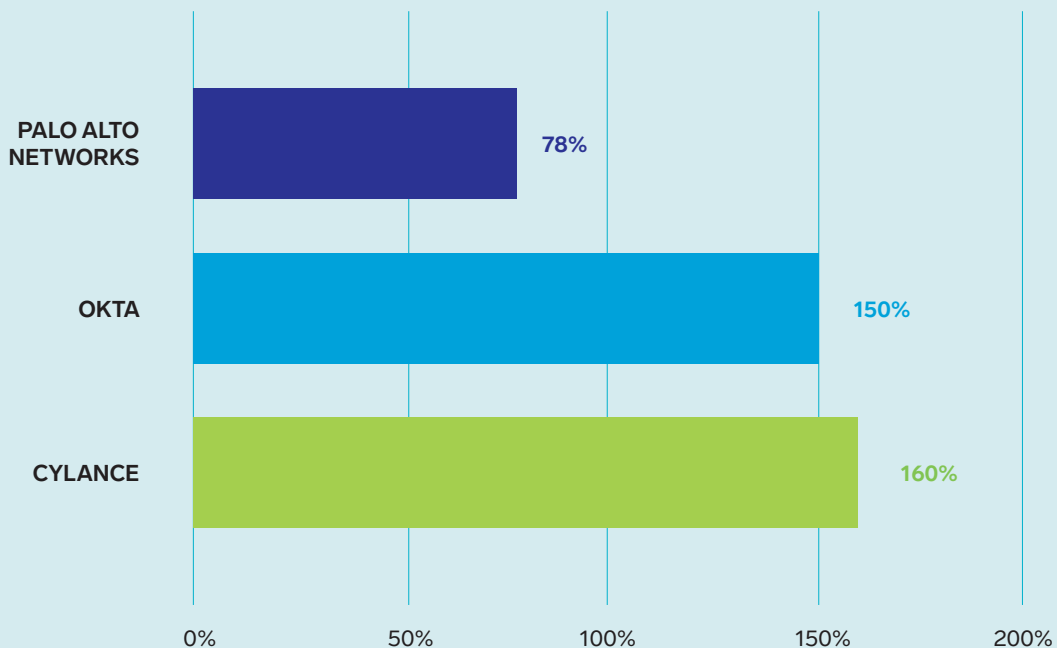
About Sumo Logic

1600+

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

MASSIVE SCALE ON AWS

Data Analyzed Daily	Searches Performed Daily	Records Queried Daily
100 + PB	**30 + Million**	**500 + Trillion**

Sumo Logic is the leading cloud-native, machine data analytics platform delivering real-time continuous intelligence, from structured, semi-structured and unstructured data across the entire application lifecycle.

Learn more at www.sumologic.com

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