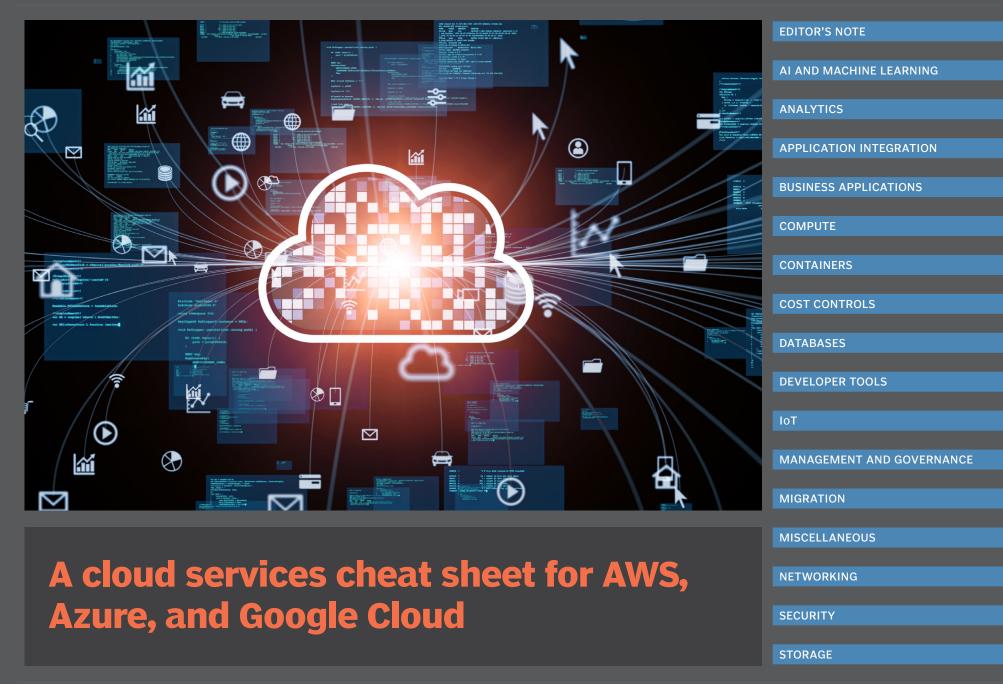
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# A cloud services cheat sheet for AWS, Azure and Google Cloud

-TREVOR JONES, SITE EDITOR

**AWS, MICROSOFT AND GOOGLE** each offer well over 100 cloud services. It's hard enough keeping tabs on what one cloud offers, so good luck trying to get a handle on the products from the three major providers.

Even trying to compare what's available in each cloud can quickly get convoluted, since naming conventions vary by vendor and service. For example, you can be forgiven for not knowing AWS Fargate, Microsoft Azure Container Instances and Google Cloud Run all essentially serve the same purpose.

So, if you ever feel at a loss for what's what, hopefully this cloud services cheat sheet will help. Consider it a guide for

cloud directories—a quick reference sheet for what each vendor calls the same service.

However, you can also use this as a starting point. You'll need to do your homework to get a more nuanced understanding of what distinguishes the offerings from one another. Follow some of the links throughout this piece and take that next step in dissecting these offerings.

That's because not all services are equal—each has its own set of features and capabilities, and the functionality might vary widely across platforms. And just because a provider doesn't have a designated service in one of these categories, that doesn't mean it's impossible to achieve the same objective. For example, Google Cloud doesn't offer an explicit disaster recovery service, but it's certainly capable of supporting DR.

Here is our cloud services cheat sheet of the services available on AWS, Google Cloud and Azure. The list is broken down by category to help you start your cross-cloud analysis. ■

Editor's note: Cloud services are constantly evolving. All information in this cheat sheet is up to date as of publication. We will periodically update the list to reflect the ongoing changes across all three platforms.

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	AWS	AZURE	GOOGLE CLOUD
AI containers	AWS Deep Learning Containers	GPU support on AKS	Deep Learning Container
Al machine images	AWS Deep Learning AMIs	Data Science Virtual Machines	Deep Learning VM Image
Chat bots builder	Amazon Lex	Azure Bot Service, QnA Maker	Dialogflow
Data labeling	Amazon SageMaker Ground Truth	Azure Machine Learning data labeling	Cloud Data Labeling
Document extraction, image content analysis	Amazon Textract	Azure Form Recognizer, Ink Recognizer, Computer Vision, Custom Vision	Vision API
Image and video recognition, indexing	Amazon Rekognition	Azure Face, Video Indexer	Video AI
Inference accelerator	Amazon Elastic Inference	GPUs on AKS	Cloud TPU, Edge TPU
Language recognition, sentiment analysis	Amazon Comprehend	Language Understanding, Text Analytics	Natural Language
Language translation	Amazon Translate	Speech Translation, Translator	Translation
Machine learning hardware	AWS Inferentia, AWS Trainium (preview*)	FPGA	Cloud TPU
Managed machine learning platform	Amazon SageMaker	Azure Machine Learning	Cloud AutoML
Online fraud detection	Amazon Fraud Detector	N/A	reCAPTCHA Enterprise
Prediction review and moderation	Amazon Augmented AI, Amazon SageMaker Clarify	Azure Content Moderator	N/A
Recommendation integration	Amazon Personalize	Personalizer	Recommendations AI (preview)
Speech recognition	Amazon Transcribe	Speaker Recognition, Speech to Text	Cloud Speech-to-Text AF

### AI and machine learning

	AWS	AZURE	GOOGLE CLOUD
Text-to-speech	Amazon Polly	Text to Speech	Cloud Text-to-Speech API
Time-series forecasting	Amazon Forecast	N/A	N/A
Vision/speech modeling packaged devices	AWS DeepLens	Azure Kinect DK	N/A

\*AWS, GOOGLE AND MICROSOFT USE DIFFERENT TERMINOLOGY TO DESCRIBE SERVICES THAT ARE IN PREVIEW, BETA OR ALPHA. FOR THE PURPOSES OF THIS PIECE, ANY SERVICE THAT IS NOT GENERALLY AVAILABLE IS LISTED AS BEING IN PREVIEW.

### **Analytics**

	AWS	AZURE	GOOGLE CLOUD
Big data processing	Amazon EMR	Azure Databricks, Azure HDInsight	Dataproc
Business analytics	Amazon QuickSight	Power BI Embedded	<u>Looker,</u> Google Data Studio
Data lake creation	Amazon HealthLake (preview), <u>AWS Lake Formation</u>	Azure Data Lake Storage	Cloud Storage
Data sharing	AWS Data Exchange, AWS Lake Formation	Azure Data Share	Cloud Dataprep (partnership with Trifacta
Data warehousing	Amazon Redshift	Azure Synapse Analytics	BigQuery
ETL	AWS Glue, Amazon Kinesis Data Firehose, Amazon SageMaker Data Wrangler	Azure Data Factory	Cloud Data Fusion, Dataflow, Dataproc
Hosted Hadoop/Spark	Amazon EMR	Azure HDInsight	Dataproc
Managed search	Amazon CloudSearch, <u>Amazon</u> <u>Elasticsearch Service</u> , Amazon Kendra	Azure Cognitive Search, Bing Search services	Cloud Search
Managed Kafka	Amazon Managed Streaming for Apache Kafka	Azure Event Hubs for Apache Kafka	N/A (available through a partnership with Confluen

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### **Analytics**

	AWS	AZURE	GOOGLE CLOUD
Real-time data streaming	Amazon Kinesis Data Analytics, Amazon Kinesis Data Streams	Azure Stream Analytics	Dataflow, Pub/Sub
Query service, data exploration	Amazon Athena, Amazon Elasticsearch Service, Amazon Managed Service for Grafana (preview)	SQL Server ML Services, Big Data Clusters (Spark), Data Lake Analytics, SQL Server Analysis Services, Azure Data Explorer	BigQuery

**Application integration** 

	AWS	AZURE	GOOGLE CLOUD
API development and management	Amazon API Gateway, AWS AppSync	Azure API Apps	API Gateway (preview), Apigee, Cloud Endpoints
Distributed app coordination	Amazon Simple Workflow Service, AWS Step Functions	Logic Apps	Cloud Tasks
Event routing, third-party integration	Amazon AppFlow, <u>Amazon</u> <u>EventBridge</u> , Amazon Simple Notification Service	Event Grid	Pub/Sub
Messaging	Amazon MQ, Amazon Simple Queue Service	Queue Storage, Service Bus	Pub/Sub
Service discovery	AWS Cloud Map	N/A	N/A
Service mesh	AWS App Mesh	Azure Service Fabric Mesh (preview)	Anthos Service Mesh
Workflow orchestration	AWS Data Pipeline	Logic Apps	Cloud Composer

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### **Business applications\*\***

	Collabora
	Documen storage
	Email and
	Low-code

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	AWS	AZURE	GOOGLE CLOUD
<b>Collaboration tool suite</b>	N/A	Microsoft 365	Google Workspace
Document sharing and storage	Amazon WorkDocs	Microsoft Word	Google Docs
Email and calendar	Amazon WorkMail	Outlook	Gmail
Low-code/no-code	Amazon Honeycode (preview)	Microsoft PowerApps, Project Bonsai (preview)	AppSheet
Video calls and chat	Amazon Chime	Microsoft Teams	Google Meet
Voice assistant	Alexa for Business	Cortana	Google Assistant

\*\*SEVERAL GOOGLE AND MICROSOFT SERVICES IN THIS SECTION ARE NOT EXPLICITLY AVAILABLE THROUGH GOOGLE CLOUD PLATFORM AND MICROSOFT AZURE, RESPECTIVELY. THEY ARE PART OF EACH VENDOR'S BROADER CLOUD PORTFOLIO.

### Compute

	AWS	AZURE	GOOGLE CLOUD
Autoscaling	AWS EC2 Auto Scaling	Azure Autoscale, Azure virtual machine scale sets	Managed instance groups (MIGs)
Batch scheduling, executing and processing	AWS Batch	Azure Batch	Batch on GKE (preview)
Functions as a service	AWS Lambda	Azure Functions	<b>Cloud Functions</b>
5G-based infrastructure	AWS Wavelength	Azure Edge Zones	Global Mobile Edge Cloud (GMEC)
High performance computing cluster management	AWS ParallelCluster	Azure CycleCloud	N/A
Isolated servers	Dedicated Instances	Azure Dedicated Host	Sole-tenant Nodes, Shielded VMs

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	AWS	AZURE	GOOGLE CLOUD
PaaS	AWS Elastic Beanstalk	App Service, Azure Cloud Services, Azure Spring Cloud, Azure Red Hat OpenShift	App Engine
On-premises/edge devices	AWS Outposts, AWS Snow Family	Azure Stack Hub, Azure Stack HCI (preview), Azure Stack Edge	N/A
Quantum computing	Amazon Braket	Azure Quantum (preview)	N/A
Virtual machines	Amazon EC2	Virtual Machines	Compute Engine
Virtual private server	Amazon Lightsail	N/A	N/A
VMware integration	VMware Cloud on AWS	Azure VMware Solution	VMware Engine

### **Containers**

	AWS	AZURE	GOOGLE CLOUD
Container registry	Amazon Elastic Container Registry (ECR), ECR Public	Azure Container Registry	Artifact Registry (preview), Container Registry
Managed container service	Amazon Elastic Container Service (ECS), Amazon Elastic Kubernetes Service (EKS)	Azure Kubernetes Service (AKS)	Google Kubernetes Engine (GKE)
Serverless container environment	AWS Fargate	Azure Container Instances (ACI)	Cloud Run

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### **Cost controls**

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	AWS	AZURE	GOOGLE CLOUD
Long-term commitment discount programs	EC2 Reserved Instances, Savings Plans	Reservations, Azure Hybrid Benefit	Committed use discounts, sustained use discounts
Low-cost, interruptible VMs	EC2 Spot	Azure Spot Virtual Machines	Preemptible Virtual Machines
Optimization tools	Amazon CodeGuru, Amazon DevOps Guru (preview), AWS Compute Optimizer, AWS Trusted Advisor, AWS Well-Architected Tool	Azure Advisor, Azure Well-Architected Review	Recommender, Network Intelligence Center, Cloud Profiler
Spending tracker and analysis	AWS Budgets, AWS Cost Anomaly Detection, AWS Cost Explorer, AWS Cost and Usage Report	Azure Cost Management and Billing	Cost Management

### Databases

	AWS	AZURE	GOOGLE CLOUD
Blockchain	<u>Amazon Managed Blockchain,</u> Amazon Quantum Ledger Database (QLDB)	Azure Blockchain Service (preview), Azure Blockchain Tokens (preview), Azure Blockchain Workbench (preview)	N/A
In-memory caching	Amazon ElastiCache (Memcached, Redis)	Azure Cache for Redis	Cloud Memorystore
NoSQL: Column-family	Amazon Keyspaces (for Apache Cassandra)	Azure Cosmos DB	Cloud Bigtable
NoSQL: Document	Amazon Document DB (with MongoDB compatibility), Amazon DynamoDB	Azure Cosmos DB	<u>Cloud Firestore</u> , Firebase Realtime Database
NoSQL: Graph	Amazon Neptune	Azure Cosmos DB Gremlin API	N/A
NoSQL: Key-value	Amazon DynamoDB, Amazon Keyspaces	Azure Cosmos DB, Table storage	Cloud Bigtable, Firestore

### Databases

	AWS	AZURE	GOOGLE CLOUD
Relational database management system	Amazon Aurora, Amazon RDS (MySQL, PostgreSQL, Oracle, SQL Server, MariaDB), Amazon RDS on VMware	Azure Database (MySQL, MariaDB, PostgreSQL), Azure SQL (Database, Edge, Managed Instance)	Cloud SQL (MySQL, PostgreSQL, SQL Server), Cloud Spanner
Time-series database	Amazon Timestream	Azure Time Series Insights	Cloud Bigtable

### **Developer tools**

	AWS	AZURE	GOOGLE CLOUD
App configuration parameter storage	AWS AppConfig	App Configuration	Cloud Storage
Artifact management	AWS CodeArtifact	Azure Artifacts, GitHub Packages	Artifact Registry (preview
Code debugging	AWS X-Ray	Visual Studio Code	Cloud Debugger, Firebase Crashlytics
CI/CD	AWS CodeBuild, AWS CodeDeploy, AWS CodePipeline, AWS CodeStar	Azure DevOps, Azure Pipelines	Cloud Build, Tekton
Development kits	AWS Cloud Development Kit, <u>Amazon</u> <u>Corretto</u>	Azure SDKs	Cloud SDK
IDEs and other tools for interacting with cloud resources	AWS Cloud9, AWS CLI, AWS CloudShell, Amazon EMR Studio	Azure CLI, Azure PowerShell, Azure Cloud Shell, Visual Studio, Visual Studio Code, Visual Studio Codespaces	<u>Cloud Code</u> , Tools for zEclipse, Tools for PowerShell
Lab environment	N/A	Azure Lab Services	N/A
Mobile and Web app development	AWS Amplify	App Service, Mobile Apps, Xamarin with Azure, Web Apps, Static Web Apps (preview)	Google Firebase
Mobile and web app testing	AWS Device Farm	Visual Studio App Center Test, Azure Test Plans	Google Firebase Test Lal
Private Git repository	AWS CodeCommit	Azure Repos	Cloud Source Repositorie

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	AWS	AZURE	GOOGLE CLOUD
Cloud-device connections, data collection and management	AWS IoT Analytics, AWS IoT Core, AWS IoT Device Defender, AWS IoT Device Management, AWS IoT Events, AWS IoT SiteWise	Azure IoT Central, Azure IoT Hub, Azure Defender for IoT, Azure Sphere	Cloud IoT Core
IoT edge compute	AWS Greengrass	Azure IoT Edge	Edge TPU
Microcontroller OS	FreeRTOS	Azure RTOS	N/A
Virtual modeling	AWS IoT Things Graph	Azure Digital Twins (preview)	N/A

# Management and governance

	AWS	AZURE	GOOGLE CLOUD
Automation	AWS CloudFormation, AWS Proton (preview), AWS OpsWorks	Azure Resource Manager, Azure Automation	<u>Cloud Deployment</u> <u>Manager</u> , Cloud Scheduler
Anomaly detection	CloudWatch Anomaly Detection	Anomaly Detector	Anomaly Detection
Application portfolio governance	AWS Service Catalog	Azure Managed Applications, Azure Blueprints (preview)	Private Catalog
Automated Windows Server management	N/A	Azure Automanage (preview)	N/A
<b>Configuration management</b>	AWS Config	Azure App Configuration	Cloud Asset Inventory
Health dashboard	Personal Health Dashboard	Resource Health, Azure Service Health	Cloud Monitoring
Hybrid and multi-cloud management	Amazon EKS Anywhere (preview), Amazon ECS Anywhere (preview)	Azure Arc	Google Anthos
License management	AWS License Manager	N/A	N/A

### **Management and governance**

		AWS	AZURE	GOOGLE CLOUD
NE	Monitoring	Amazon CloudWatch, Amazon CloudWatch Logs, AWS Transit Gateway Network Manager, Amazon Lookout for Metrics (preview), Amazon Managed Service for Prometheus (preview)	<u>Azure Monitor</u> , Network Watcher, Log Analytics	Operations, Cloud Operations for GKE (formerly Stackdriver), Network Intelligence Center
	Multi-account management	AWS Control Tower, AWS Organizations	Azure Management Groups, Azure Lighthouse	N/A
	Policy management	AWS Organizations	Azure Policy	Organization Policy Service
	Telemetry collection and response	AWS Systems Manager	Azure Monitor	Service Monitoring (preview)
	Web-based user interface	AWS Management Console	Azure Portal	Cloud Console

Migration

	AWS	AZURE	GOOGLE CLOUD
Database migration	AWS Database Migration Service	Azure Database Migration Service	Database Migration Service (preview)
Data transfer appliance	Snow Family	Data Box	Transfer Appliance
Disaster recovery	CloudEndure Disaster Recovery	Azure Site Recovery	N/A
Online data transfer	AWS DataSync, AWS Transfer Family	Azure File Sync	BigQuery Data Transfer Service, Cloud Data Transfer
On-premises application analysis	AWS Application Discovery Service, Migration Evaluator	Azure Migrate, Movere, Azure Resource Mover (preview)	N/A

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### Migration

	AWS	AZURE	GOOGLE CLOUD
On-premises and cloud storage integration	Storage Gateway	StorSimple	N/A (offered by partner Cloudian)
Migration tracker	AWS Migration Hub	Azure Migrate	N/A
Server migration	AWS App2Container, AWS Server Migration Service, CloudEndure Migration	Azure Migrate	Migrate for Anthos, Migrate for Compute Engine, VM migration

### **Miscellaneous**

	AWS	AZURE	GOOGLE CLOUD
Customer engagement	Amazon Connect, Contact Lens for Amazon Connect	Azure Communication Services (preview)	Contact Center AI
End user communications	Amazon Pinpoint, Amazon Simple Email Service	Azure Notification Hubs	Firebase Cloud Messaging
Gaming	Amazon GameLift, Amazon Lumberyard	Game Stack	Game Servers
Geolocation APIs and services	Amazon Maps API, Amazon Location Service (preview)	Azure Maps	Google Maps Platform
Genomics	N/A	Microsoft Genomics	Cloud Life Sciences (preview)
Industrial and other workplace monitoring tools	Amazon Lookout for Vision, Amazon Lookout for Equipment, Amazon Panorama, Amazon Monitron	Azure IoT	Vision AI
Media services	Amazon Elastic Transcoder, AWS Elemental suite, Amazon Interactive Video Service, Amazon Kinesis Video Streams	Azure Media Player, Content Protection, Encoding, Live and On-Demand Streaming, Live Video Analytics (preview), Media Services	OpenCue

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### **Miscellaneous**

	AWS	AZURE	GOOGLE CLOUD
Mobile access to internal web apps	Amazon WorkLink	N/A	Identity-Aware Proxy
Robotics application development	AWS RoboMaker	N/A	Cloud Robotics Core
Satellite ground stations	AWS Ground Station	Azure Orbital (preview)	N/A
Virtual desktop	Amazon WorkSpaces, Amazon AppStream 2.0	Windows Virtual Desktop	N/A
Virtual reality, mixed reality app development	Amazon Sumerian	Azure Digital Twins (preview), Kinect DK, Remote Rendering (preview), Spatial Anchors	Google VR

# Networking

	AWS	AZURE	GOOGLE CLOUD
Build, deploy and manage APIs	Amazon API Gateway	Azure API Apps, API Management	Apigee API Management Platform
Content delivery network	Amazon CloudFront	Content Delivery Network (CDN)	Cloud CDN
Dedicated fiber connection between VPCs and private network	AWS Direct Connect	Azure ExpressRoute	Cloud Interconnect
Domain name system	Amazon Route 53	Azure DNS	Cloud DNS
Load balancing	Elastic Load Balancing (ELB)	Application Gateway, Load Balancer, Traffic Manager	Cloud Load Balancing
Network accelerator	AWS Global Accelerator	Accelerated Networking	Premium Network Service Tier
Network area translation	NAT Gateway	Virtual Network NAT	Cloud NAT

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Satellite ground station	AWS Ground Station	Azure Orbital (preview)	N/A
Service discovery	Amazon ECS, AWS Cloud Map	N/A	Service Discovery (preview)
Traffic control plane	AWS App Mesh	Azure Front Door, <u>Azure Service Fabric</u>	Traffic Director
Virtual WAN	N/A	Virtual WAN	N/A
VPC	Amazon VPC	Azure Virtual Network	Virtual Private Cloud
VPC/VM secure connector	AWS Transit Gateway, AWS VPN	Azure Bastion, Azure Private Link, Azure VPN gateway	Cloud VPN, Direct Peering

### Security

	AWS	AZURE	GOOGLE CLOUD
Audit and compliance reports	AWS Artifact, AWS Audit Manager	Service Trust Portal	N/A
Centralized security management	AWS Security Hub	Security Center	Security Command Center
Certificate management	AWS Certificate Manager	App Service Certificates	Certificate Authority Service (preview)
Confidential computing	AWS Nitro Enclaves	Azure Confidential Computing	Confidential Computing (preview)
Container deploy-time security control	N/A	N/A	<b>Binary Authorization</b>
Data discovery and classification	Amazon Macie	Data Discovery & Classification (feature of Azure SQL Database, Azure SQL Managed Instance and Azure Synapse Analytics)	Data Catalog, Cloud Data Loss Prevention

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Distributed denial-of- service (DDoS) protection	AWS Shield	Azure DDoS Protection	Google Cloud Armor
End-user identity management	Amazon Cognito	Azure Active Directory B2C	Firebase Authentication
Firewall management	AWS Firewall Manager, AWS WAF	Azure Firewall, Web Application Firewall	Cloud Armor, Cloud firewalls
Identity and access management	AWS Identity and Access Management	Azure Active Directory, role-based access control (Azure RBAC)	Identity and Access Management, Identity Platform, Identity-Aware Proxy
Key management	AWS Key Management Service, AWS CloudHSM	Key Vault, Azure Dedicated HSM	Cloud Key Management
Multifactor authentication	AWS Multi-Factor Authentication	Azure MFA	Google Authenticator, <u>Titan Security Key</u>
Microsoft Active Directory compatible directory service	AWS Directory Service for Microsoft Active Directory	Azure Active Directory Domain Service	Managed Service for Microsoft Active Directory
Resource access management	AWS Resource Access Manager	Azure Resource Manager	Resource Manager
Security data analysis	Amazon Detective	Security Center	Chronicle
Secrets management	AWS Secrets Manager	Azure Key Vault	Secret Manager
Single sign-on	AWS Single Sign-On	Azure Active Directory single single-on	Cloud Identity
Signoff for cloud provider data access requests	N/A	Customer Lockbox	Access Transparency

### Security

	AWS	AZURE	GOOGLE CLOUD
Threat Detection	Amazon GuardDuty	Advanced Threat Protection, Azure Defender	Chronicle, Phishing Protection, Web Risk, Event Threat Detection (preview)
Vulnerability scanning	Amazon Inspector	Security Center	Web Security Scanner

### **Storage**

	AWS	AZURE	GOOGLE CLOUD
Archival storage	S3 Glacier, S3 Glacier Deep Archive	Archive Storage	Archive Storage
Backup	AWS Backup	Azure Backup	N/A
Block storage	Amazon Block Store (EBS)	Disk Storage	Persistent Disk, Local SSD
File storage	Amazon Elastic File Service (EFS), Amazon FSx for Windows File Server, Amazon FSx for Lustre	File Storage, Azure NetApp Files	<u>Filestore</u>
Object storage	Amazon S3	Blob storage	Cloud Storage, Cloud Storage for Firebase

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