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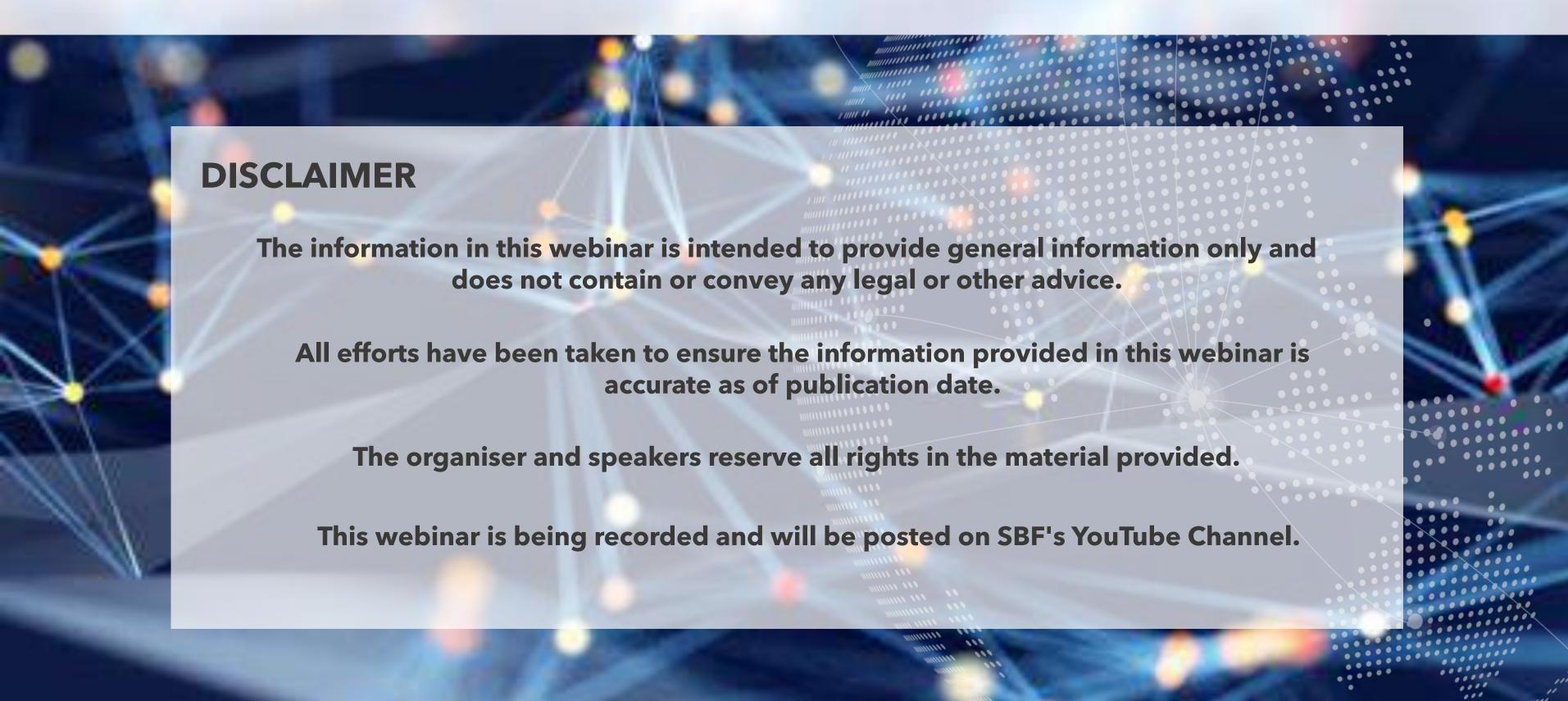




PARTICIPATING COMPANIES



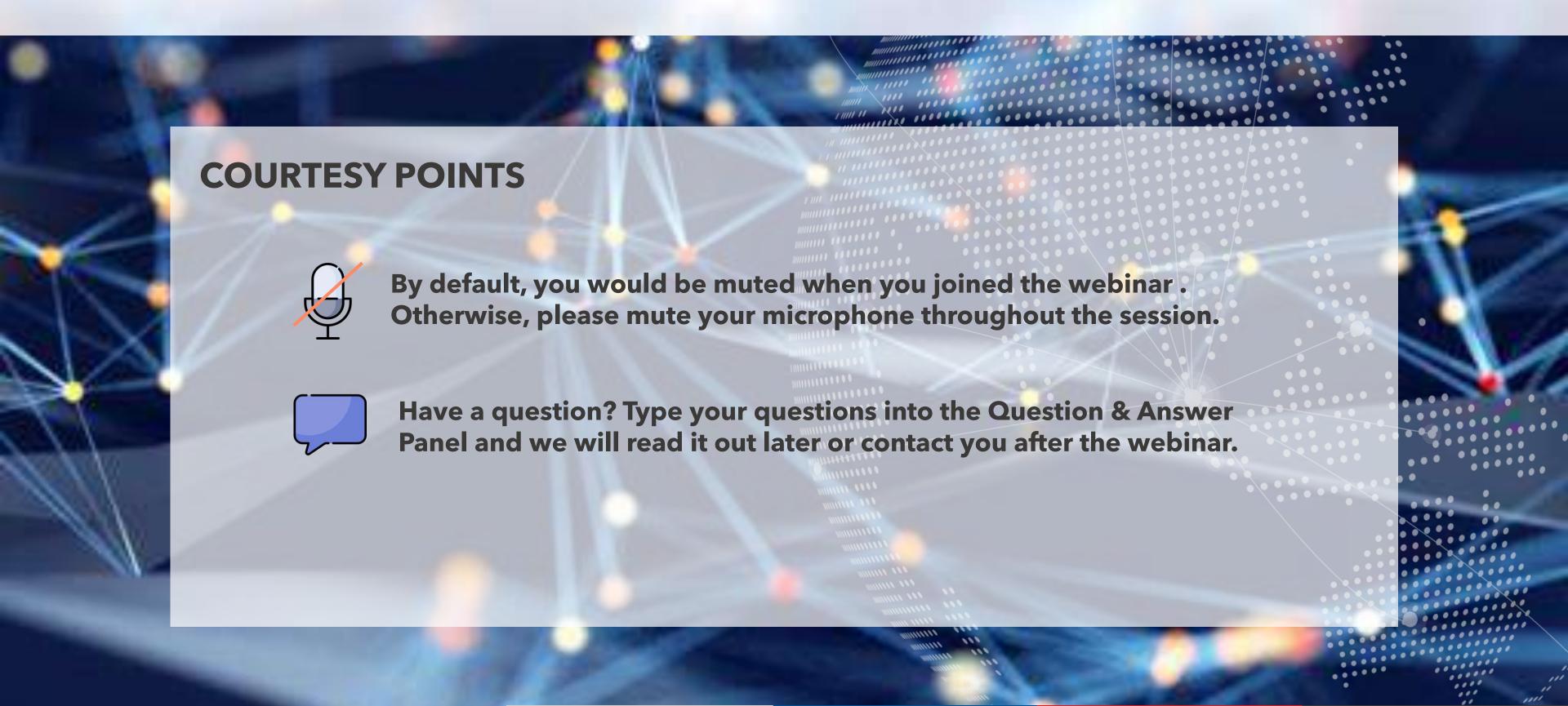




Connecting your business to global opportunities









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Learn with us

- About markets
- About new customers
- About Free Trade Agreements

Because knowledge is power.

Land with us

- Dedicated digital spaces
- Established networks
- Hands on advice and facilitation

Scale and grow smartly.

Localise with us

- Trusted relationships abroad
- Deepen market presence
- Secure long-term sustainability

Because network is net worth.

GLOBAL CONNECT@SBF

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https://globalconnect.sbf.org.sg/



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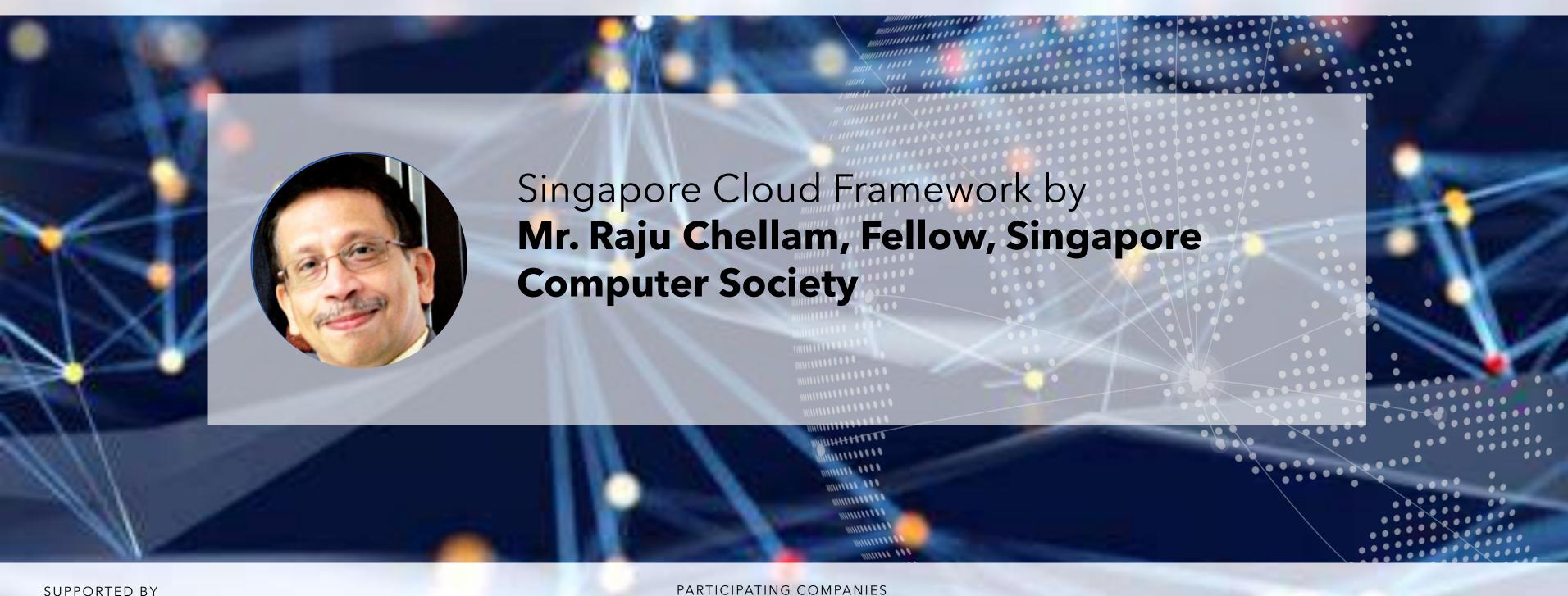
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Singapore Cloud Framework

Raju Chellam Aug 03, 2021

The Agenda

A: Apps

B: Business

C: Commercial

D: Digital Natives

E: Enhanced PDPA

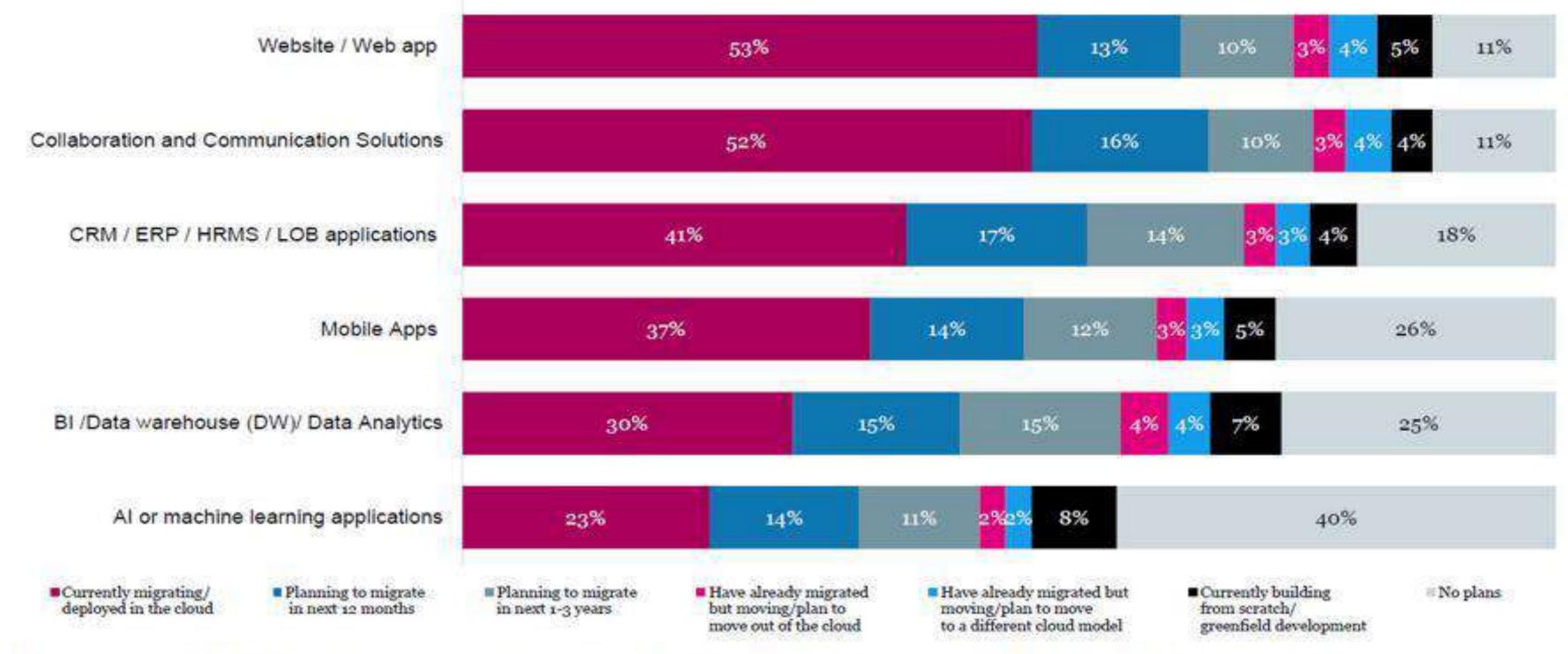
F: Final Slides

Speaker Profile:

- Chair: ITSC Cloud & Data
- Chief Editor: AI Ethics BoK
- VPres: SCS Cloud Chapter
- Author: Organ Gold (Dark Web)

A: Apps

Top Applications in the Cloud

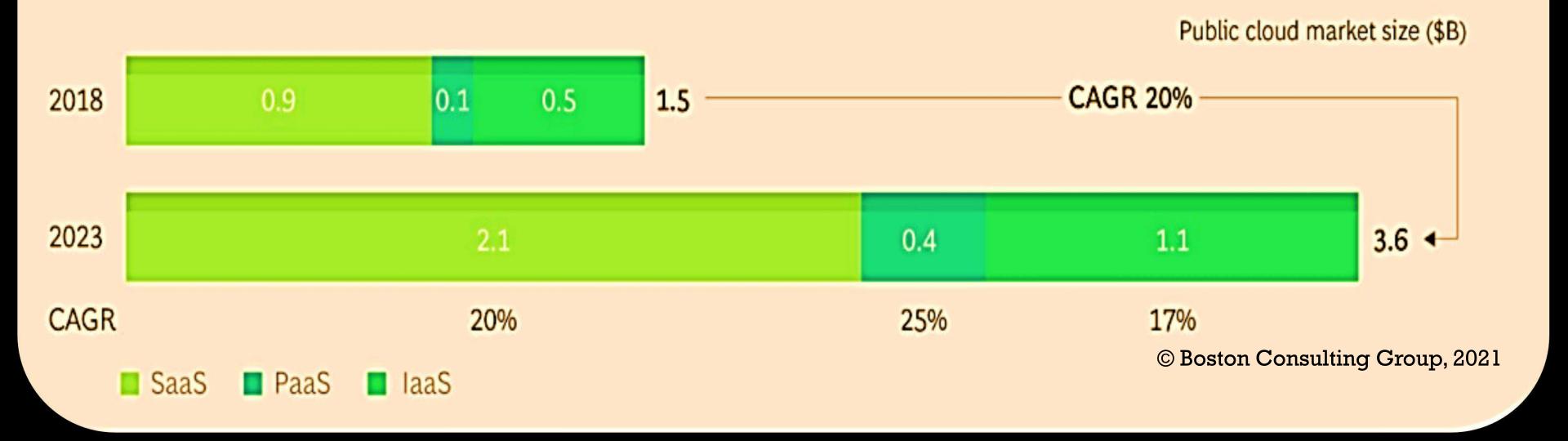


Q. Please use the scale below to describe your organization's plans for building, employing, or migrating each of the following types of applications/workloads.



B: Business

EXHIBIT 23 | Market overview: Public cloud market in Singapore is expected to grow from \$1.5B to \$3.6B at a CAGR of 20% over 2018-23

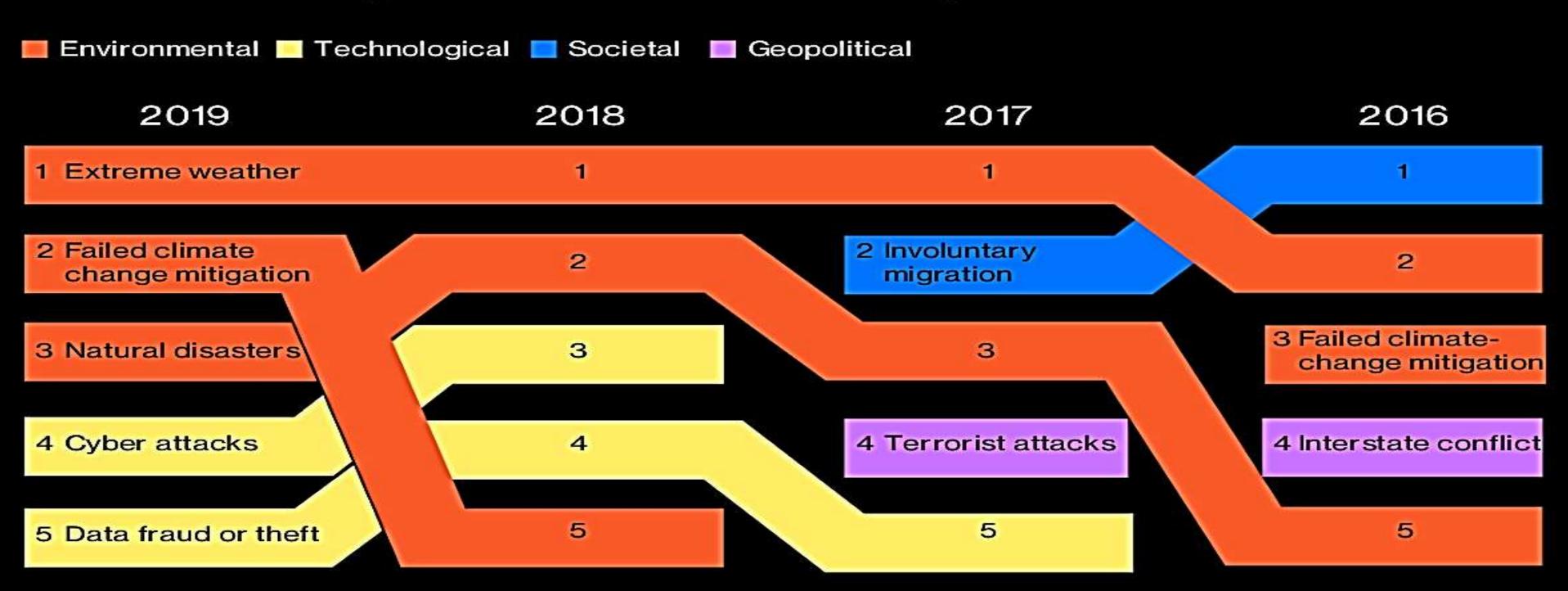


BCG: "Most large enterprises @SG have begun to use some form of cloud storage or computing. SG enterprises starting to tap into more advanced use cases such as AI & ML. SaaS model currently has 45% share, but PaaS is the fastest-growing segment (25% CAGR-)2023).

C: Cybersecurity

Biggest Global Risks

Environmental dangers dominate the WEF's survey for 2019



Source: World Economic Forum Global Risks Report

Bloomberg

D: Digital Natives



MEDIA SMES GO DIGITAL

3 STEPS TO

Support available

- Pre-Approved Solutions
- Start Digital Pack
- Grow Digital
- Consultancy Services (SME Digital Tech Hub)
- **Government Grants** (e.g. Productivity Solutions Grant (PSG); SkillsFuture Enterprise Credit (SFEC))
- Digital Resilience Bonus
- Advanced Digital Solutions

Is your business digital-ready?

Find out using the Industry Digital Plan (IDP) for your sector.

How do you get started?

Take up pre-approved solutions with grant support.

Where can you get

Contact your nearest SME Centre for support.

SMEs are at the heart of S'pore's economy.

SMEs employ 66% of S'pore's workforce & contribute ~50% of S'pore's GDP.

With digital tech transforming every sector, it is imp to ensure SMEs make the most of digital tech to boost ops & generate new revenue.

(details @IMDA)

E: Enhanced PDPA

TRUSTED DATA SHARING FRAMEWORK

SG:D





Enhanced PDPA for Businesses

The enhanced PDPA is part of ongoing efforts to enhance protection of personal data while supporting organisations to thrive amidst new technology, business models and global developments in the digital economy.

This Framework is intended for use in the commercial and non-governmental sectors but excludes data sharing in or with the public sector.

Ensure all employees are aware of PDPA requirements and properly trained in personal data protection.



TR 62: 2018 (ICS 35.020; 35.210)

Published by

Enterprise Singapore

TECHNICAL REFERENCE

Guidelines for cloud outage incident response (COIR)



Sides of the Cloud

F: Final Slide

Two Coin



SS 584 : 2013 (ICS 35.020; 35.040; 35. 240.01)

SINGAPORE STANDARD

Specification for multi-tiered cloud computing security



Thank You

rajuchell@ protonmail.com

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Stateful Streaming Analytics Platform for Logs, Metrics, and Security Data

Modern observability with no reliance on storage or indexing



Lior Redlus

Co-founder & Head of Solution

Engineering

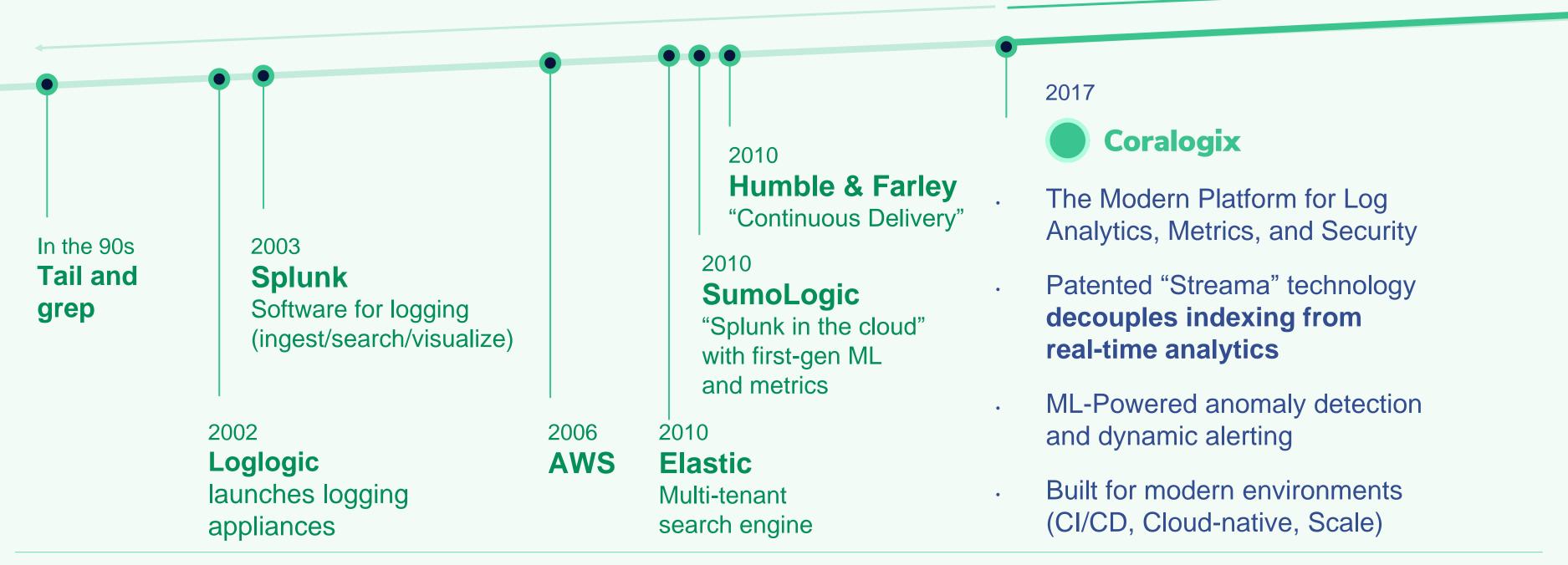
Coralogix

lior@coralogix.com



A Brief History of Logging and Observability

Legacy Solutions are reactive— Ingest, Index, then Analyze Modern Observability is proactive – Ingest, Analyze, then Index



Legacy Solutions

- Store logs as unstructured system data
 High storage costs and overages
- Analyze data once it's been indexed
 Reactive, manual alerting; Slow MTTI/MTTR
- Data streams are unpredictable
 Data loss/throttling when quotas are exceeded
- Built for legacy architecture and workflows
 Incompatibility with modern CI/CD pipelines
- Use proprietary search languages
 Vendor lock-in, requires full-time SME



- Triages and prioritizes data before indexing
 Full data coverage & up to 70% storage savings
- Analyzes data in real time using ML
 Proactive monitoring; Reduced MTTD/MTTR
- Auto-scales to meet your needs
 No overages, throttling or data loss EVER
- Born in the cloud, built for CI/CD
 Proactive monitoring and feedback loops
- Uses OSS syntax known by most engineers
 No vendor lock-in, no SME required



Secure by Design

Coralogix is fully compliant with the highest standards of privacy and security and provides multiple geographic data centers for compatibility with various local privacy laws.



















The Coralogix Platform

Full Observability to Build, Run, and Secure Modern Applications & Infrastructures



Log Analysis

Analyze, monitor, and visualize your log data before indexing for proactive insights with no coverage or cost limitations.



Metrics

Track, visualize, and alert on all system metrics, with unlimited cardinality and labeling for no extra cost.

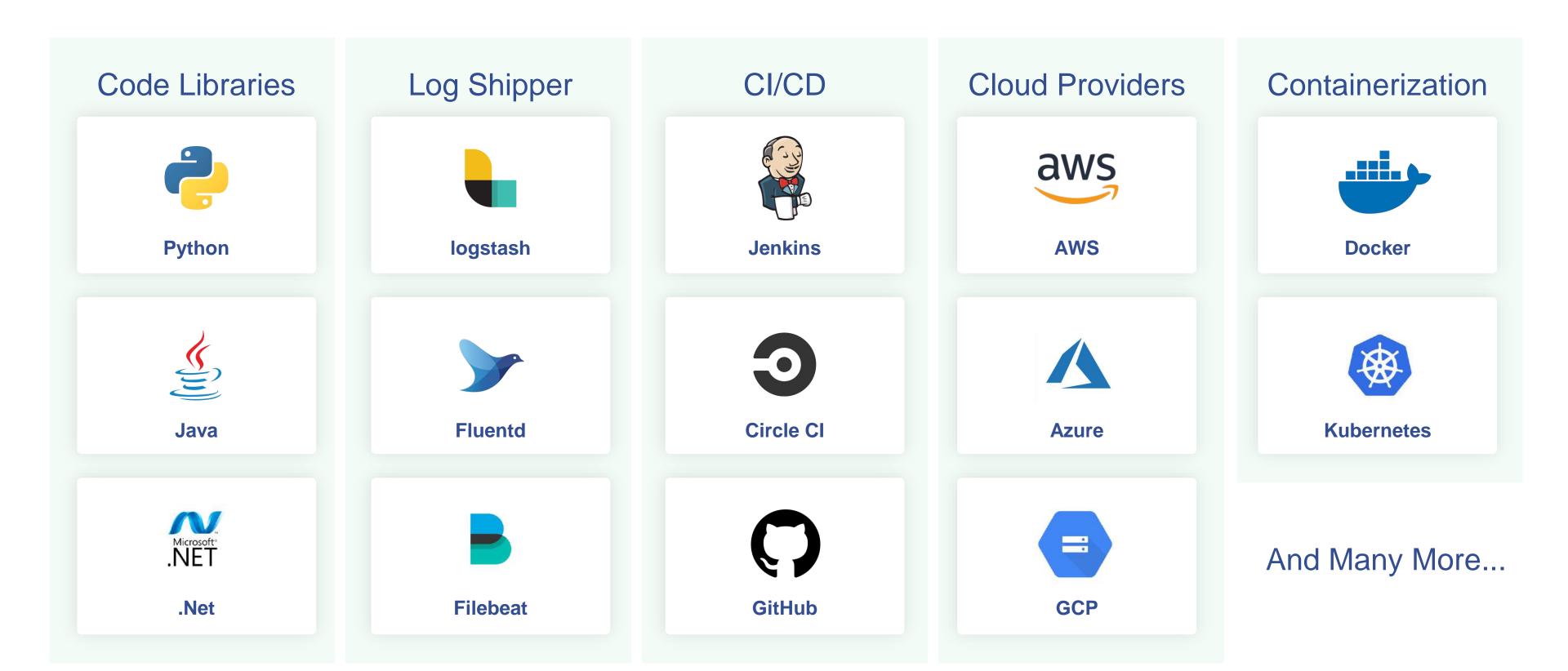


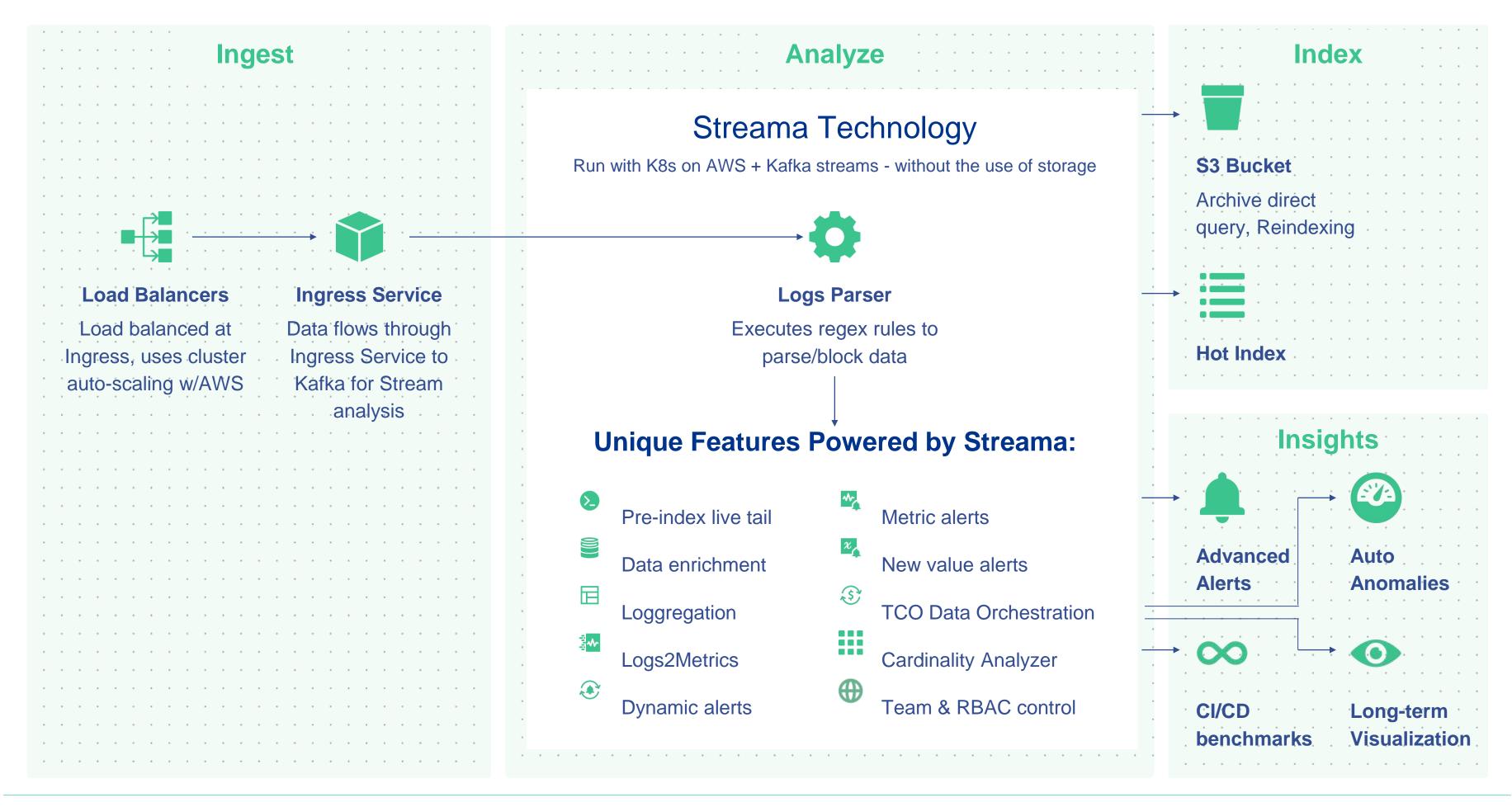
Security

Fully secure your cloud environments within minutes. Easy to set up, no need for data standardization, no coverage uncertainty.



We Work the Way You Work





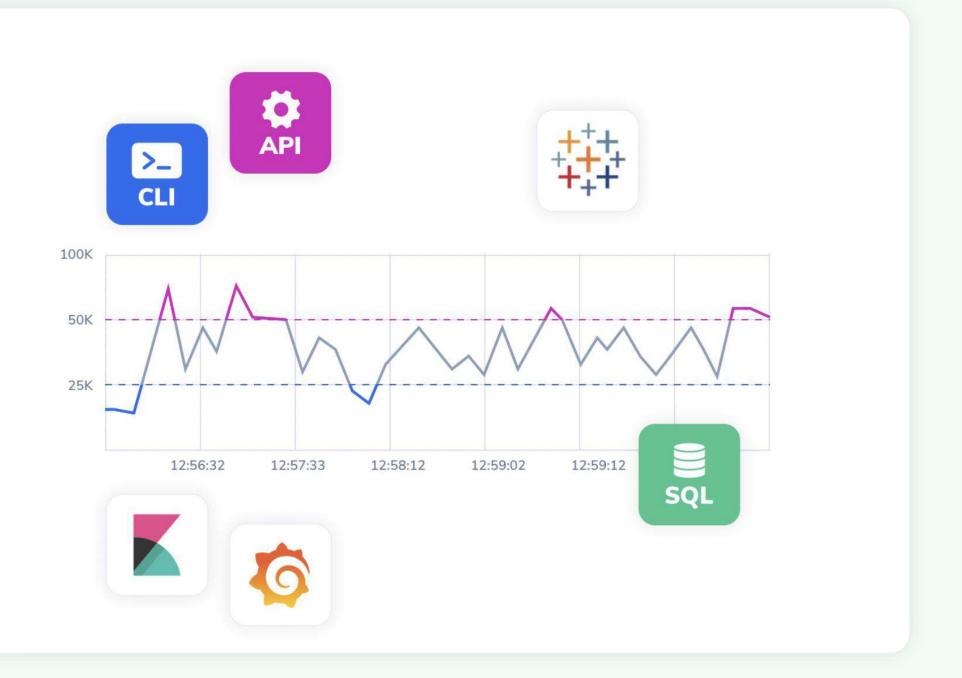


Any data, Any dashboard, Any syntax

Not a data warehouse, a data platform

Connect any data, in any format, and view anywhere including our purposebuilt UI, Kibana, Grafana, SQL clients, Tableau, or using our CLI and full API support.

Avoid vendor lock-in, and streamline setup and adoption in your organization.



Use-cases

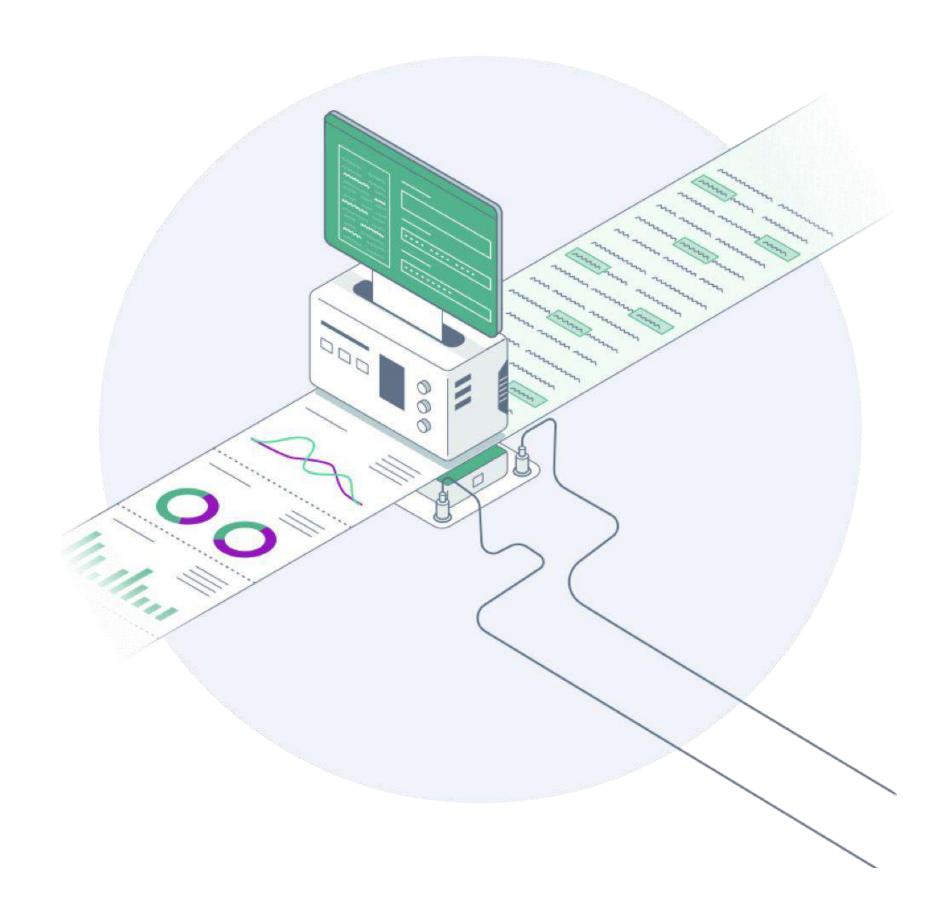




Log Analysis & Monitoring

Analyze, monitor, and visualize your log data before indexing for proactive insights with no coverage or cost limitations.

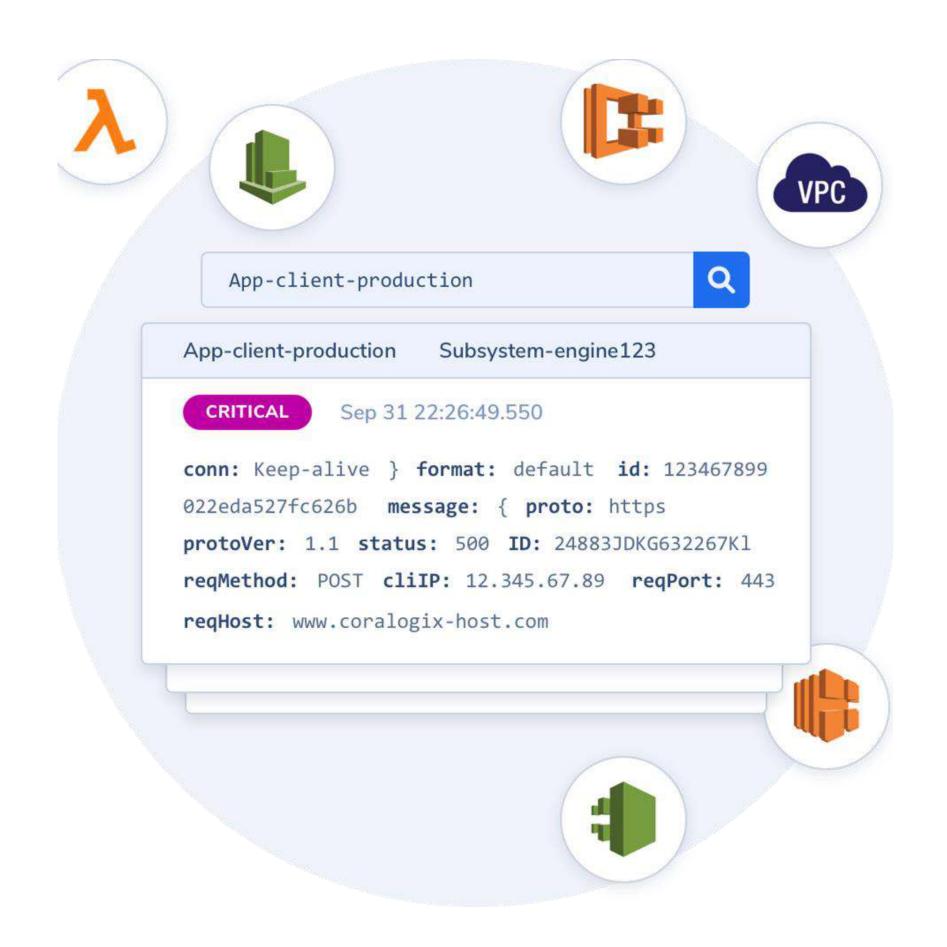
- Auto-parsing
- Live tail
- Log clustering
- Anomaly detection
- Dynamic ML-alerts



AWS Observability

Analyze, monitor, and visualize all AWS data with direct integrations to all major AWS technologies.

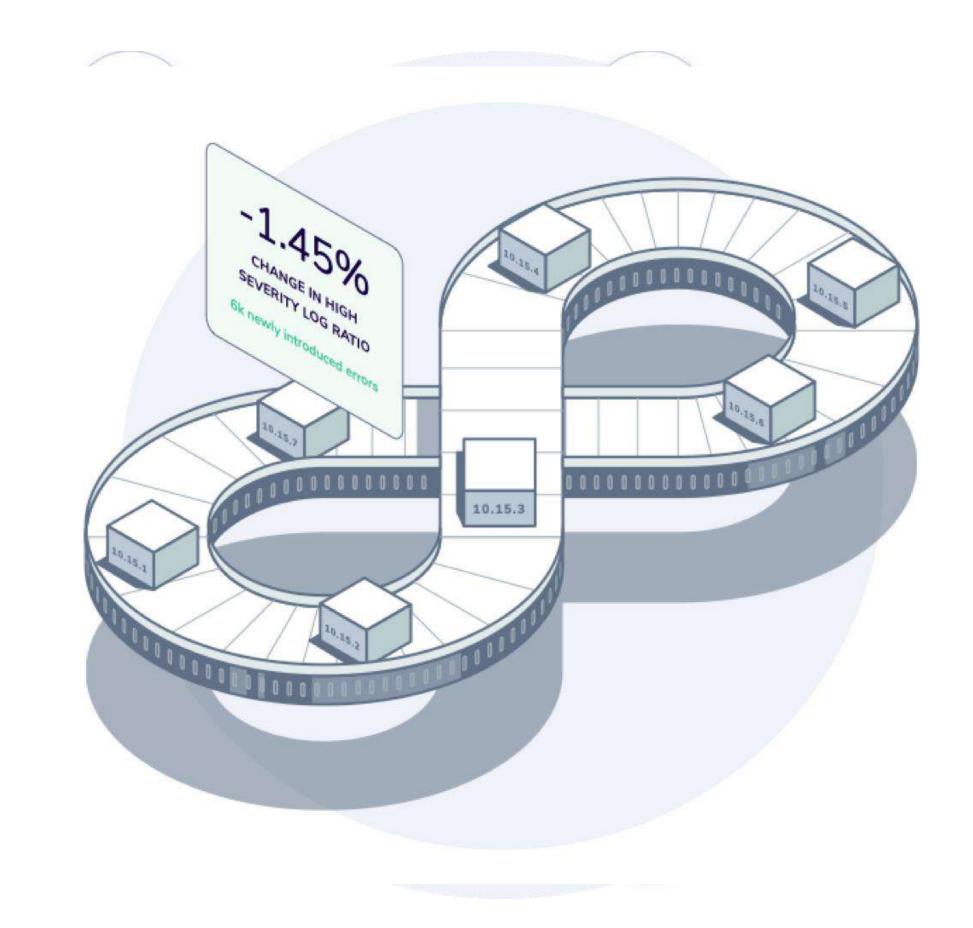
- Centralized data collection
- 3-Click cloud security
- AWS Advanced Technology Partner
- Certified Marketplace Listing
- AWS Serverless App Repo



CI/CD Acceleration

Correlate real-time insights with specific releases without the restrictive costs of other solutions.

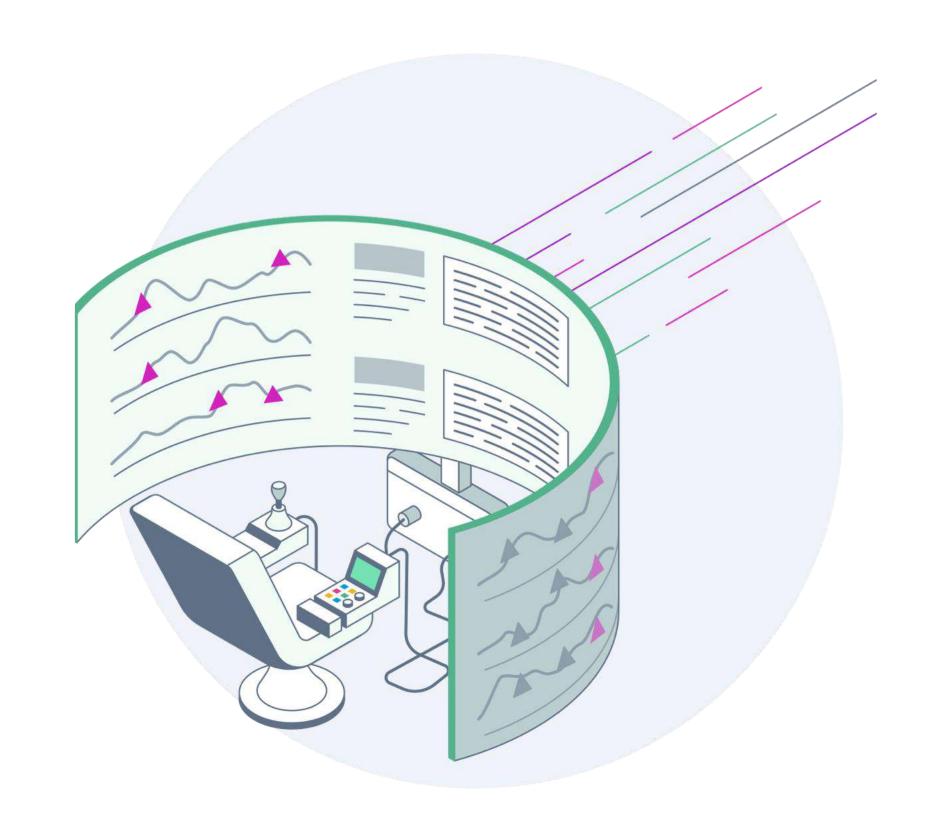
- Centralized data collection
- Data clustering
- Version benchmarking
- Dynamic alerting
- Auto-scaling



Homegrown Alternative

Fully managed observability platform that scales effortlessly and comes with advanced, out-of-the-box features.

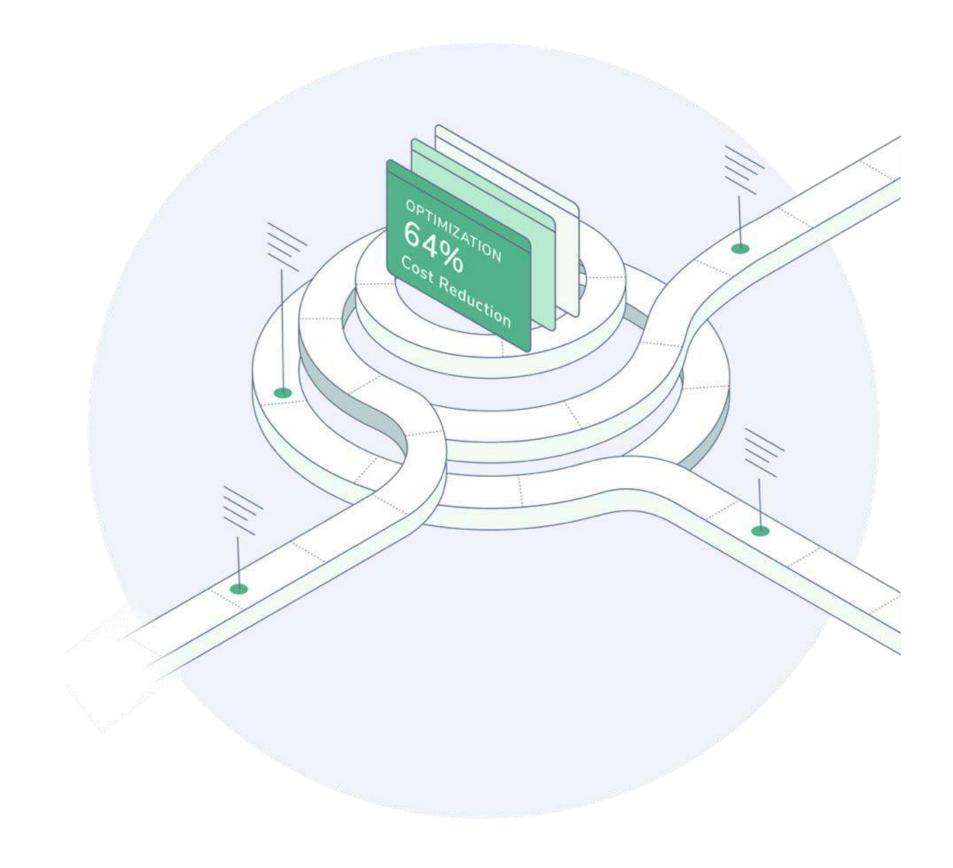
- Auto-parsing and data enrichment
- Live tail
- Data clustering
- ML-powered anomalies & alerts
- Direct archive query
- Version benchmarking
- No vendor lock-in
- 24/7 support



Cost (TCO) Optimization

Data prioritization before storing or indexing data reduces monitoring costs while simultaneously improving system visibility.

- All data analyzed <u>before</u> indexing
- Powered by Streama
- Prioritize data based on use case
- Full monitoring capabilities for archived data
- Direct archive query and reindexing
- Full feature access, always



Contextual Data Analysis

Get added context and deeper system observability by ingesting small pockets of data to be correlated with errors and system health metrics.

- Cloud availability reports
- Repository insights
- CI/CD events
- AWS SNS
- Alert aggregators
- Corporate chats
- 3rd party status pages
- Support platforms
- Security events



You're in Good Company



































MONDAY.COM - JOURNEY TO MODERN OBSERVABILITY

//. monday.com	"Now, we can see the full picture from the applications to the logging systems without having to manage any of the complexity." – Ben Yitzhaki, Infrastructure Engineer		
CLOUD-BASED WORK OS	CHALLENGES WITH TRADITIONAL LOGGING:		
	- No unified logging across systems		
\$130M 10X	- Explosive system growth (3TB to 30TB log volume per month)		
ANNUAL LOG VOLUME REVENUE GROWTH	UNIFIED LOGGING WITH CORALOGIX:		
	- Integrated and achieved full coverage within 48 hours		
60% \$100K REDUCED SAVED/YEAR	- Immediate identification of 750 previously unknown issues		
MTTR	- Data normalization and log templating to enhance data value		
	- AWS Cloud Security implemented		

Questions?



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Real-time Continuous Optimization

Improve Performance. Reduce Compute Costs.

Reduce Costs by

60%

Reduce Response Time by

40%

Increase Throughput

5X

Code Changes

0

Organizations Face Difficulties Managing & Optimizing Infrastructure

Million users, 50-50,000 VMs all with unique requests

Third party service providers



Organizations Face Difficulties Managing & Optimizing Infrastructure

1 Million users, 50-50,000 VMs all with unique requests Service X Service A DB **⊘** Service Y Service Z Third party service providers

The Growing Infrastructure And Workload Optimization Challenge

Optimization At Scale Is Highly Complex



Technical Complexity

Requires deep performance expertise



Outside Core Business

Distraction from product & business logic



→ Dynamic Environments

Ever changing workload & resource consumption

Shared Responsibility

Responsibility shared between R&D & DevOps

Leading To Unfulfilled Performance Potential

2-5X

Untapped Performance

30% - 40% Utilization

Tens Of Billions USD In Wasted Compute Costs Annually

Our Solution Real-Time Continuous Optimization

Automatically Analyze
Granulate automatically learns your application specific resource usage patterns and data flow

Continuously Optimize
Granulate tailors OS-level scheduling
and prioritization decisions regarding
CPU, network, locks, and memory
accesses



Improve Performance
Granulate reduces response time and increases throughput of every machine

Reduce Compute Costs
Leverage improved performance to
reduce cluster size and downsize

compute resources

The Secret Sauce

Granulate agents optimize performance continuously adapting to application workload -

- Kernel Module resource allocation
- Runtime Module application level improvements, without code changes or restart

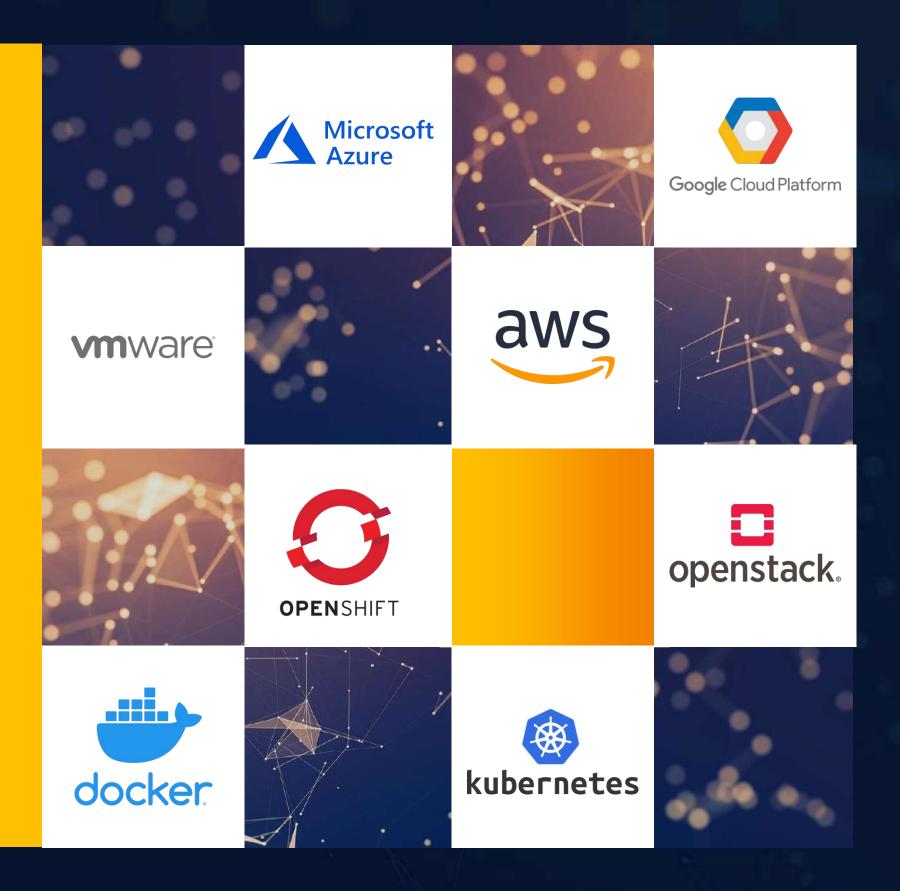


GRANULATE

GRANULATE

Agnostic and Integrates With All Architectures

Hybrid, multi cloud and on prem





Completely Autonomous Optimization Of A Unique Focal Point Across The Tech Stack

Infrastructure Agnostic

- All Architectures
- All Environments



Microsoft Azure







Simple Installation

- Single Command Line
- Start From A Single VM
- Completely Automated









Past Initiatives Agnostic

- Discount Purchasing
- Cloud Hygiene
- Rightsizing







No R&D Efforts

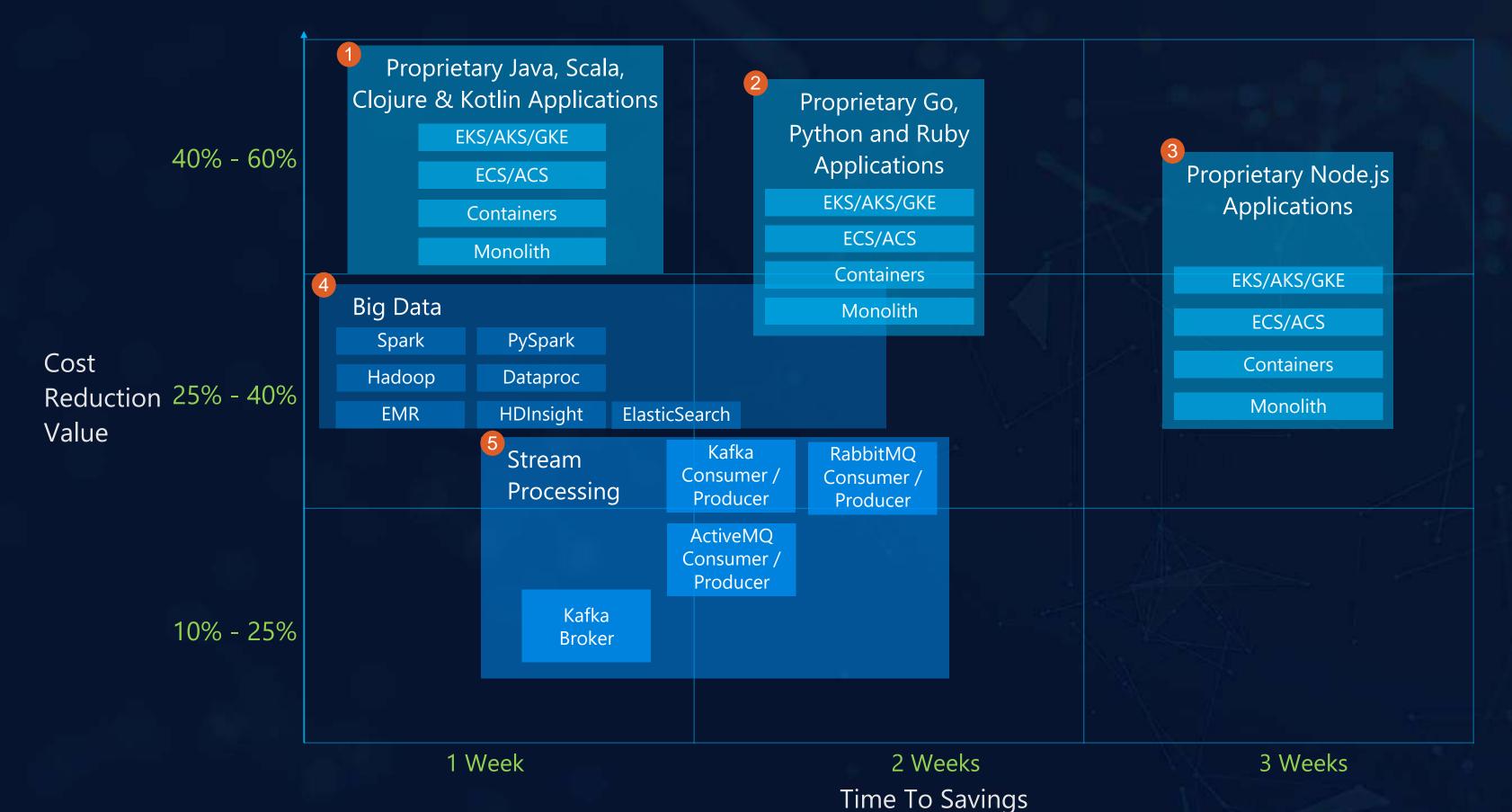
- No Code Changes
- No Maintenance
- No Configuration



Quick Value - Cost Cutting And Better Performance Within 2 Weeks



Use Cases – Cost Reduction Optimization



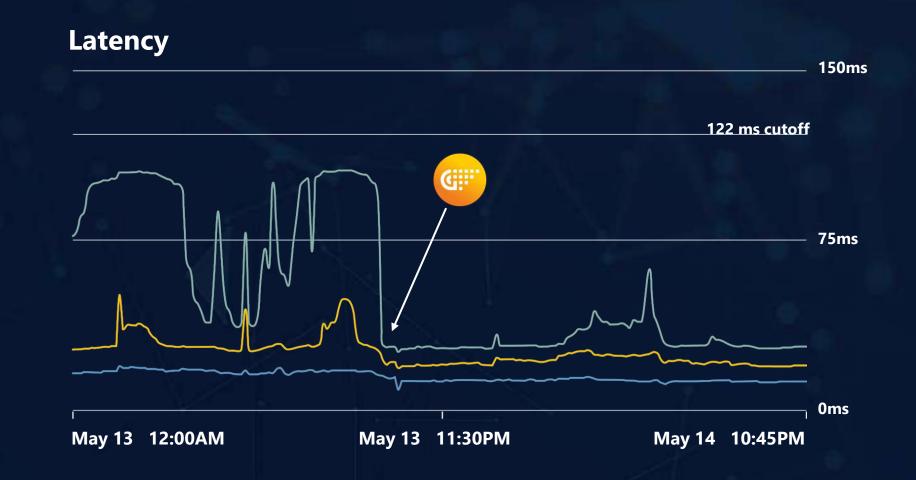




Real Time Bidding

Reduced Compute Cost by 75%

70% Reduced P95 Latency



2X

Throughput Increase

90%

Less Timeout

0%

CPU Utilization Increase

75%

Reduction In Cluster Size

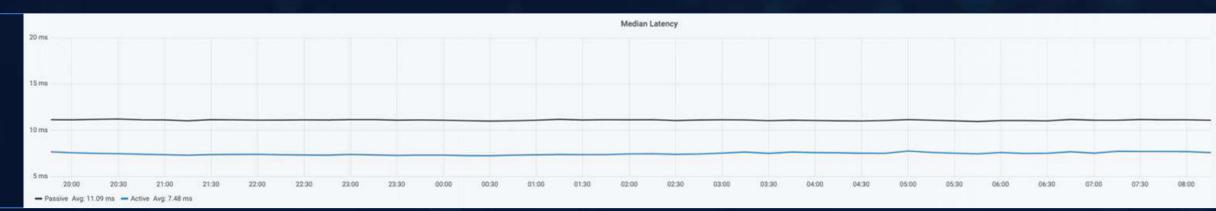


START/APP

Reduced Compute Cost by 33% In Addition To

30%

Reduced Median Latency

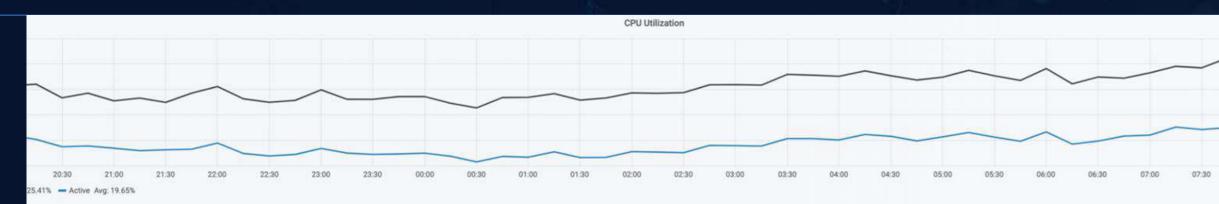


15%

Increased Throughput



23%
Reduced CPU Utilization





Moving Forward



- Identify 1-3 relevant scenarios
- Determine success criteria

Install on 2-5 VMs

- Performance report
- Summary & discussion
- Decide on deployment

- Full service deployment
- Additional scenarios





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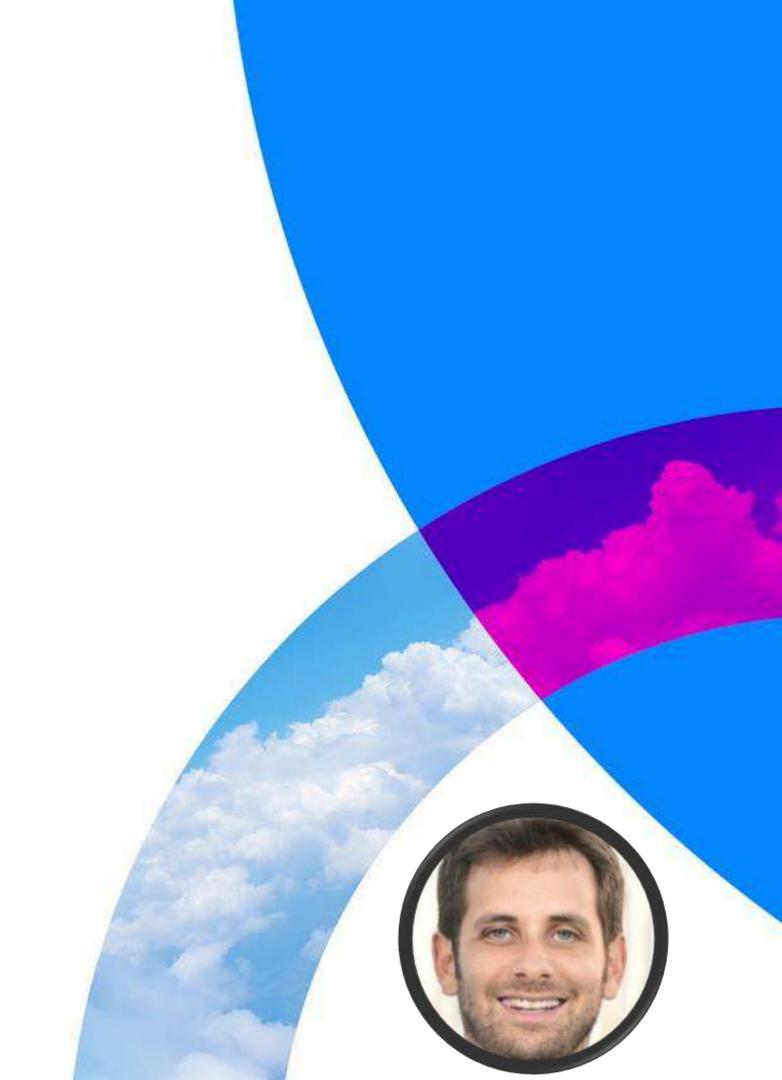


Spot by NetApp

Cloud automation for continuous optimization

Give your workloads the cloud infrastructure they deserve: Always available, always scalable, always at the lowest possible cost

Michael Nassie
© 2021 Spot. Tegritory. manager APAC | mnassie@netapp.com



COVID-19 accelerated the push to public cloud

According to CIOs in APAC:

89%

said COVID-19
lead to a significant increase in workloads in the cloud

47%

said more than half of their workloads are now in the public cloud

60%

CIOs said their biggest challenge was higher than expected cloud cost



Source: ADAPT COVID-19 research 2020

■ NetApp



Why is Optimization so difficult?

According to CIOs in APAC:

Lack of internal cloud expertise

Architectural challenges and process complexity

These can contribute to cloud wastage and ultimately, overspending







What is Spot?

- Founded in 2015 as Spotinst by IDF compute infrastructure specialists (MAMRAM)
- Offered a SaaS cloud infrastructure automation platform
- Rebranded to Spot.io in early 2020, right about the time they met NetApp
- Sold the solution to NetApp and saved NTAP about 70% cost on AWS
- NetApp acquires the company in June 2020
- Spot.io rebranded Spot by NetApp

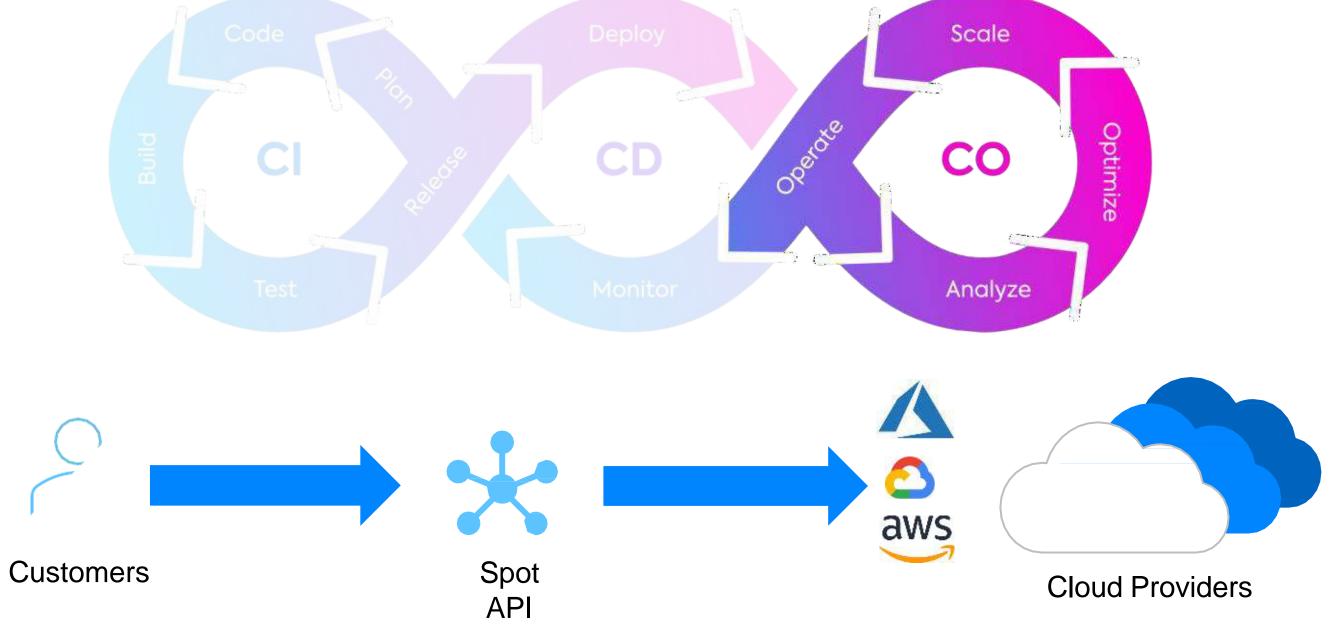






Cloud automation for Continuous Optimization Spot extends application delivery pipelines with "CO"

application delivery pipelines with CO





Spot Value Proposition

Spot by NetApp is a cloud optimization solution that works with customers to Automate and reduce cloud compute and operational costs.

Spot helps customers by:

- Automating cloud provisioning & consumption
- Optimizing workloads to maximize resource utilization
- Enabling customers to take advantage of more volatile, cost effective components without decreasing service availability or increasing operational overhead





Challenge

Cost optimization is often still a manual process it is not effective for Cloud Native Ops

Optimization automation initiatives takes a large effort to develop & maintain, increasing time to value

Cloud environments are becoming more complex and variable making it difficult to measure efficiency

Enterprises have multiple cloud environments, with various constraints and availability requirements

Average of 30% of Cloud spend is being wasted, hindering progress and innovation and resources

Cloud costs are very volatile and difficult to predict and measure return on investments



Solution

Monolith to Cloud Native, Spot offers continuous automated optimization, saving upto 80%

Spot.io is a turn key, enterprise grade managed platform, time to value < 30 days

Spot.io is a single pane of Glass which measures efficiency on KPI's

Spot.io covers your full environment staging to production, with SLA for service availability

Spot.io removes waste from Commitments and 65% of RI's are resaleable

Spot provides a results based business model with savings based billing to guarantee ROI



Global market leader for continuous optimization – ASEAN & worldwide

1500+

Customeís

5B+

Compute Hís / Month

1M+

Concuííent Managed Nodes

73%

Aveíage Savings



































Spot by NetApp product suite

A comprehensive portfolio of compute services to provision, run, and scale applications in the cloud

Cloud cost visibility

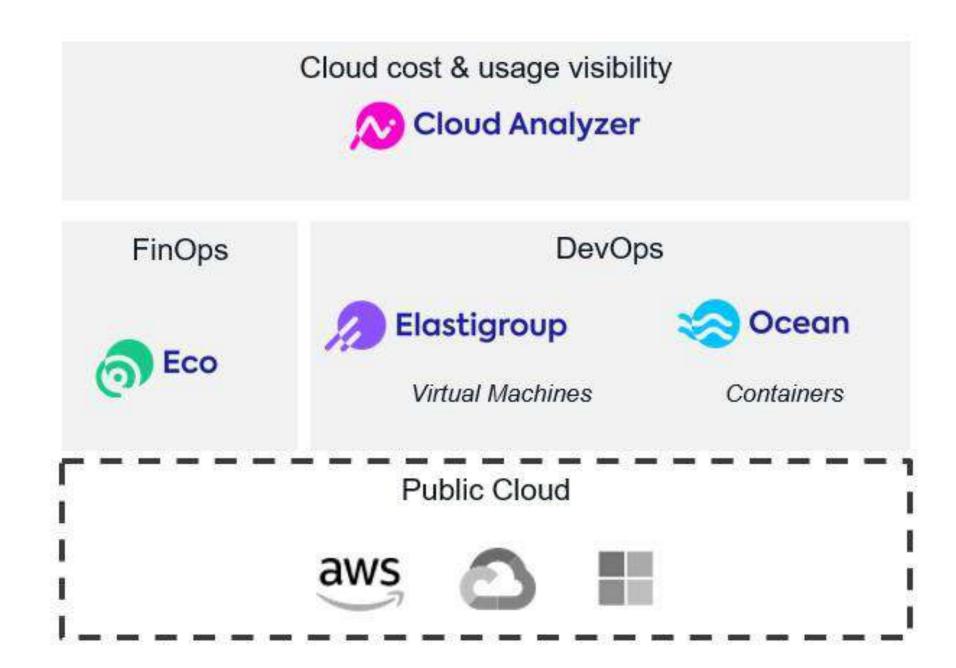
See, understand and take action to reduce cloud costs and improve cloud efficiency.

Infrastructure optimization

Automate and optimize cloud infrastructure pricing and rightsizing to deliver availability and performance at the lowest possible cost.

Active capacity management

Purchase the optimal portfolio of reserved capacity and respond to changes in usage automatically.





S p o t u t

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On-demand

- Scales up and down for variable demand
- Expensive per-unit cost

Reserved capacity

- More affordable per unit
- Less flexible Committed to future use

Excess capacity

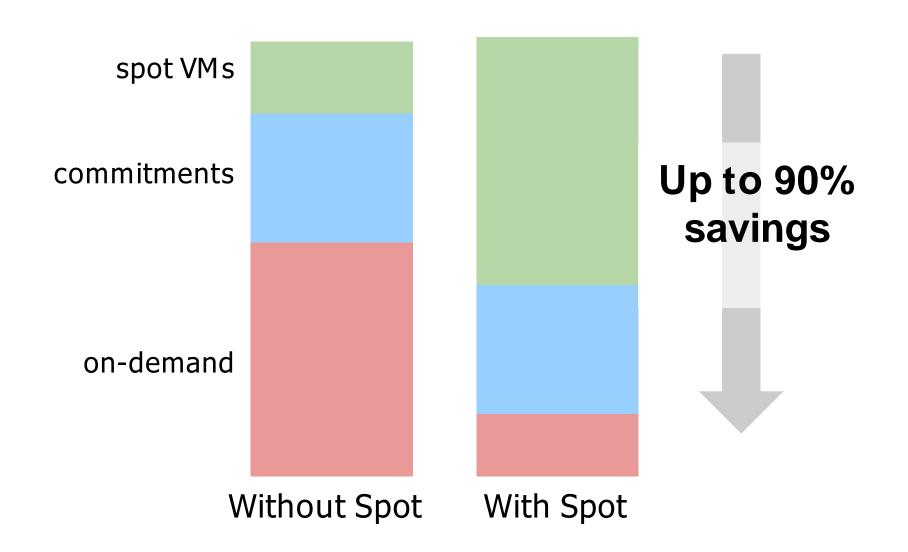
- Cheapest option
- Riskiest No SLA / Can be taken away at any moment

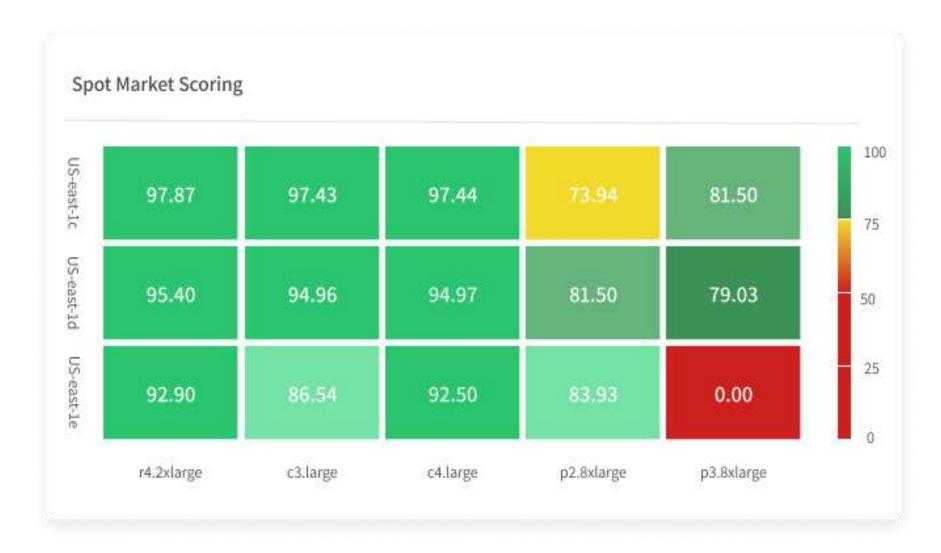
Spot takes continuous real time decisions to automate the best purchase model based on the service requirements



Spot by NetApp: Our core value proposition

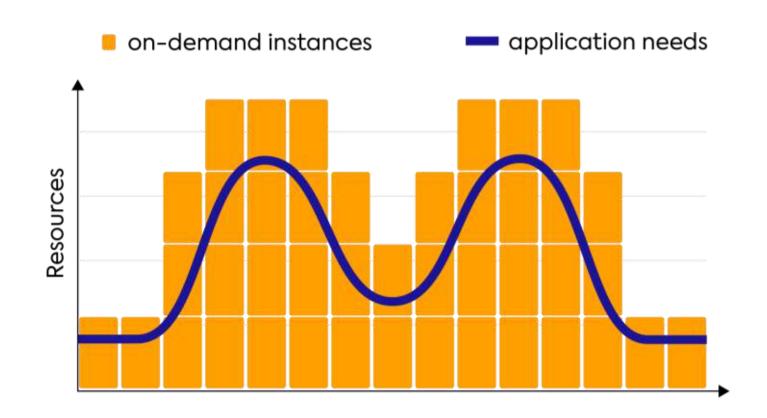
Up to 90% less on compute, while maintaining SLAs & SLOs







Enabling agility & speed



Self-managed

- Overprovisioning
- Mostly On demand/Reserved
- Homogeneous compute

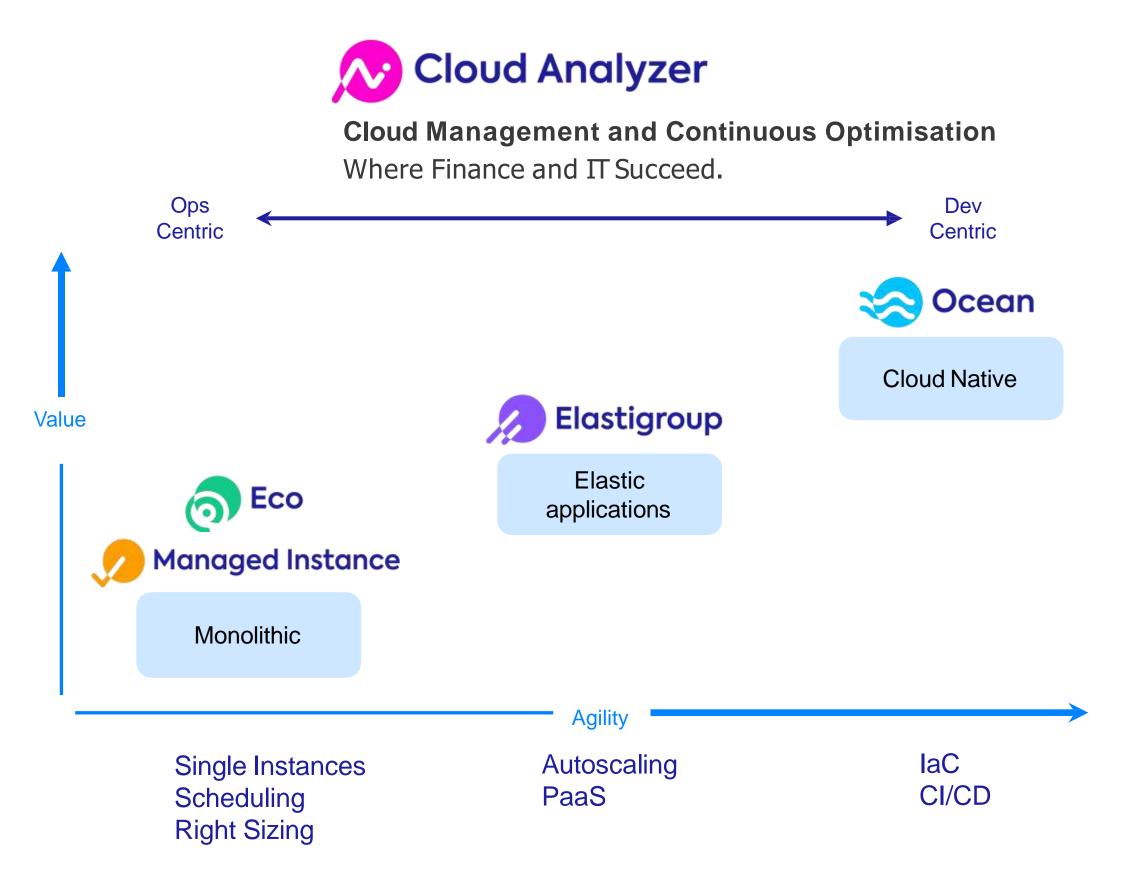


With Spot

- App driven provisioning
- Price level optimization
- VM size level optimization
- Container size level optimization
- Heterogeneous compute



Covering your Cloud Usage Transformation



Challenges

As you scale and grow cloud capability, the traditional approach to Cost optimization no longer delivers value

Cross functional teams struggling to implement basic changes

Visibility tools stop being effective due to ownership and fluidity

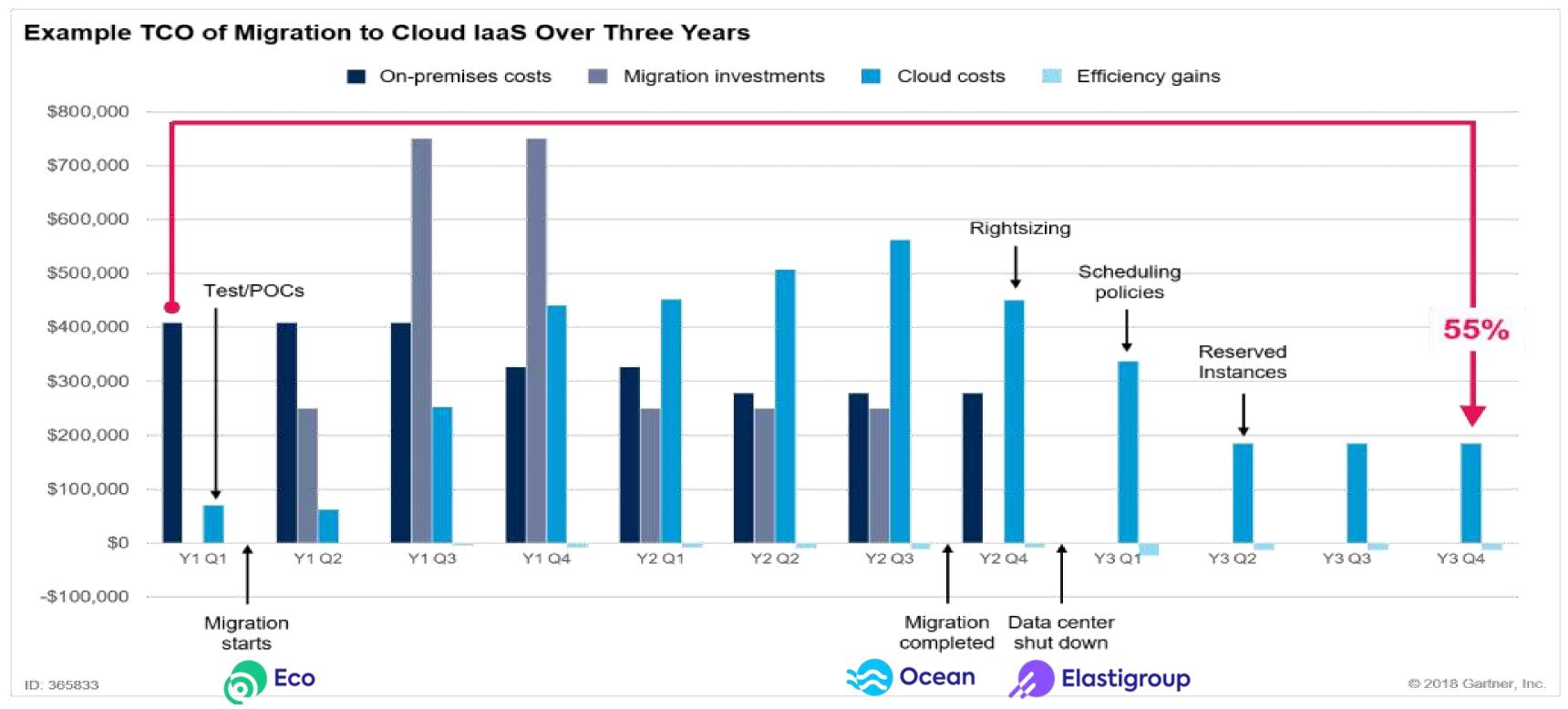
Deployment of complex cloud native applications and services increases

Classic optimization tooling to report on wastage and recommendations no longer work

How to automate the process of optimization, integrating the tooling into your IAC and CI/CD processes



Help & Accelerate your Cloud Migration Process



Lower your day 0 footprint cost without affecting your infra Keep commitment flexibility for business & tech. Deploy & scale cloud native services architecture Accelerate cloud adoption & optimize consumption Source: Gartner



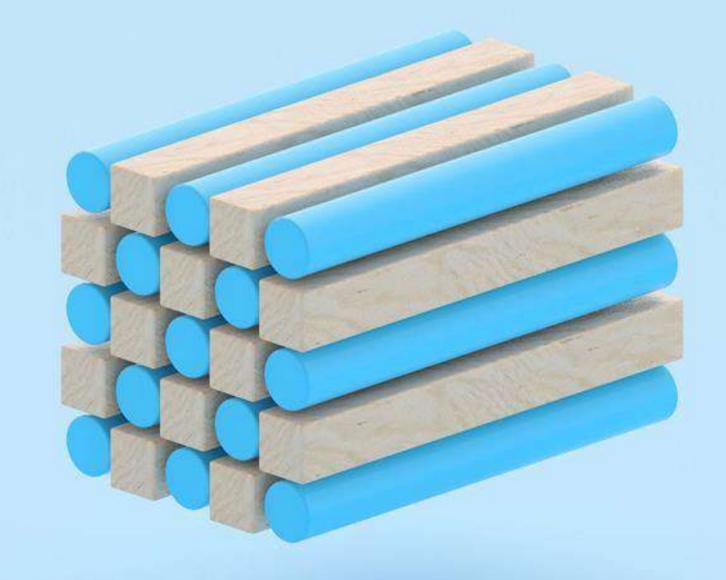




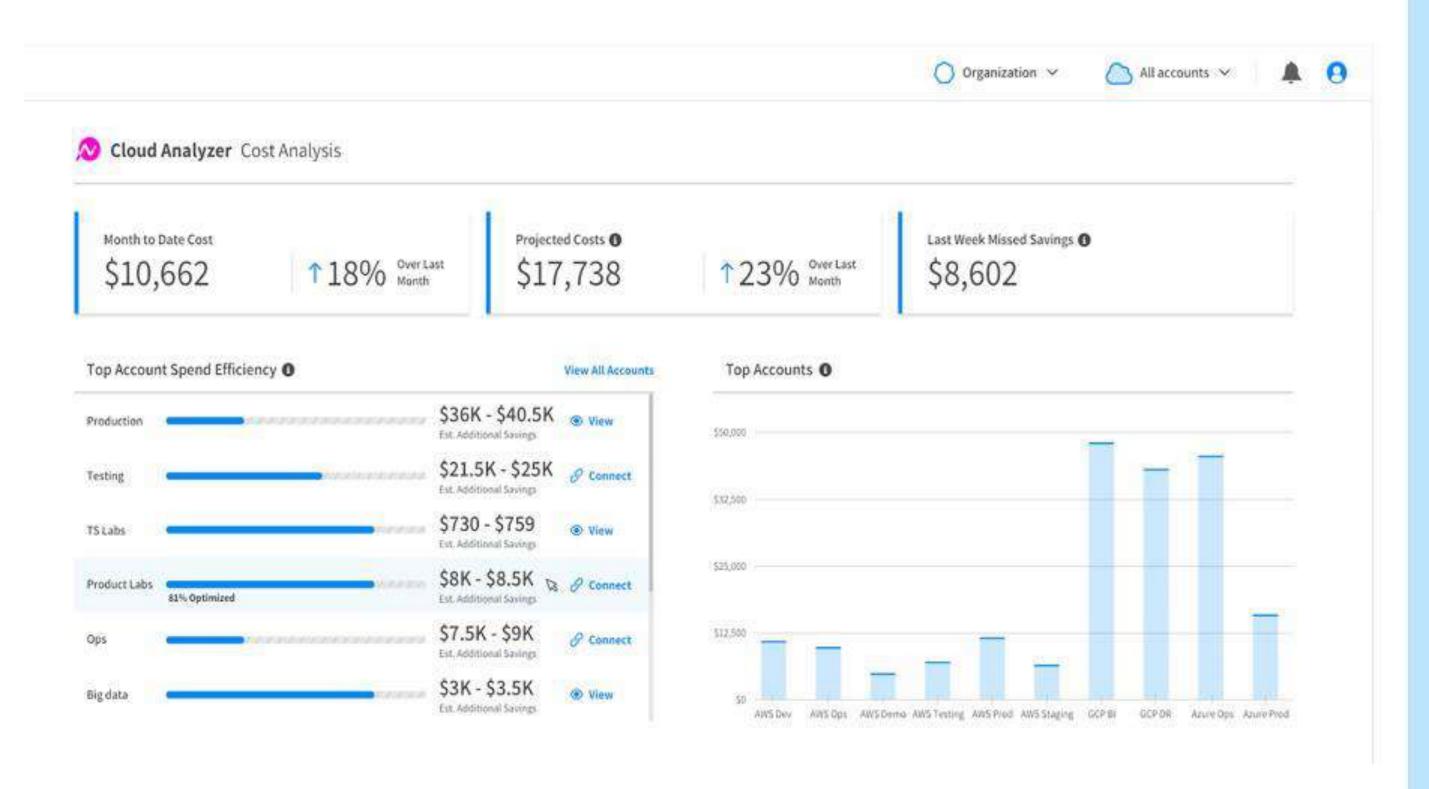
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6 9 0 N Cloud Analyzer Cloud Management & Continuous Optimisation h



Cost Analysis



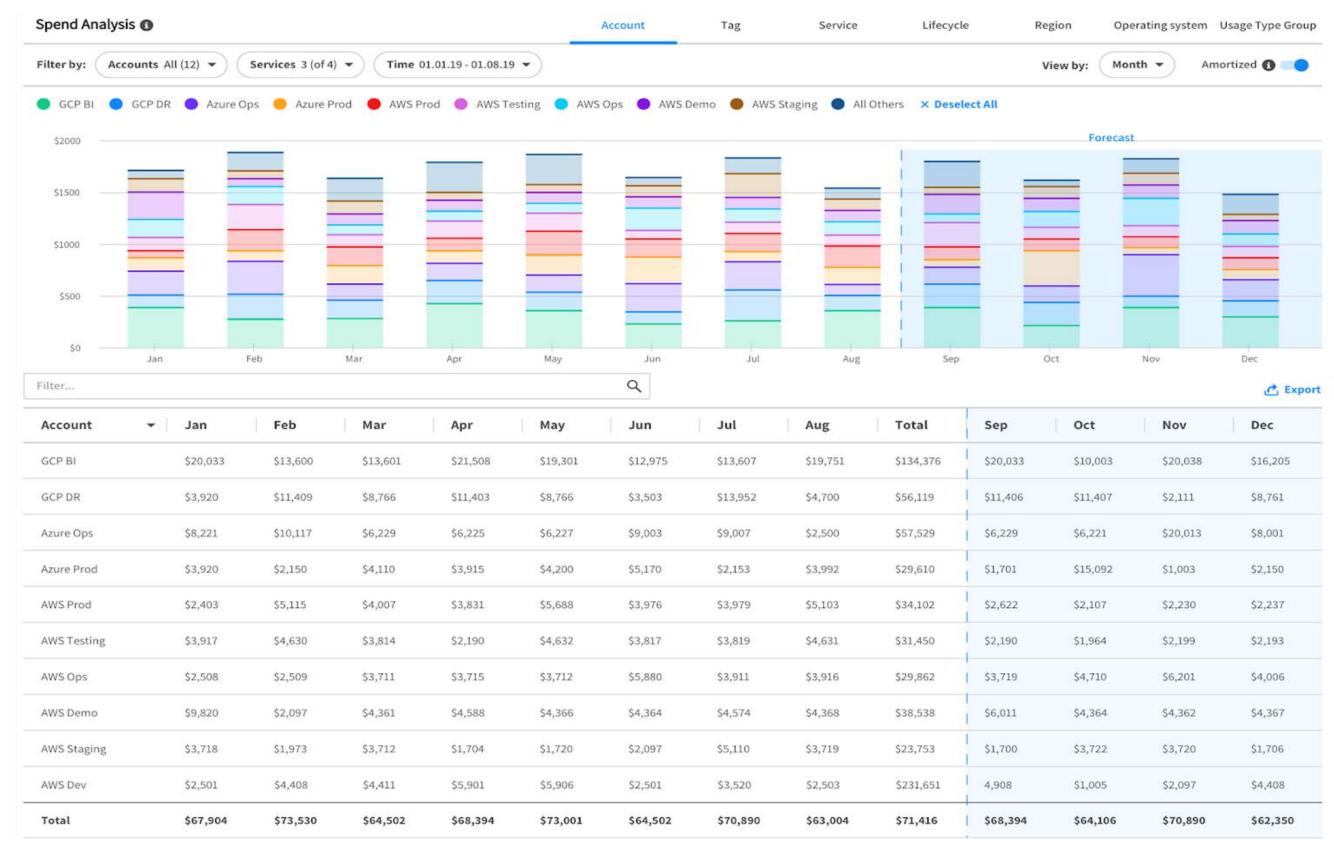
Visually explore your spend across clouds & cost centers

Measure you Account Efficiency to target where you can be more economical

View projected costs and trends

Target services and accounts where you are missed savings

Spend Analysis



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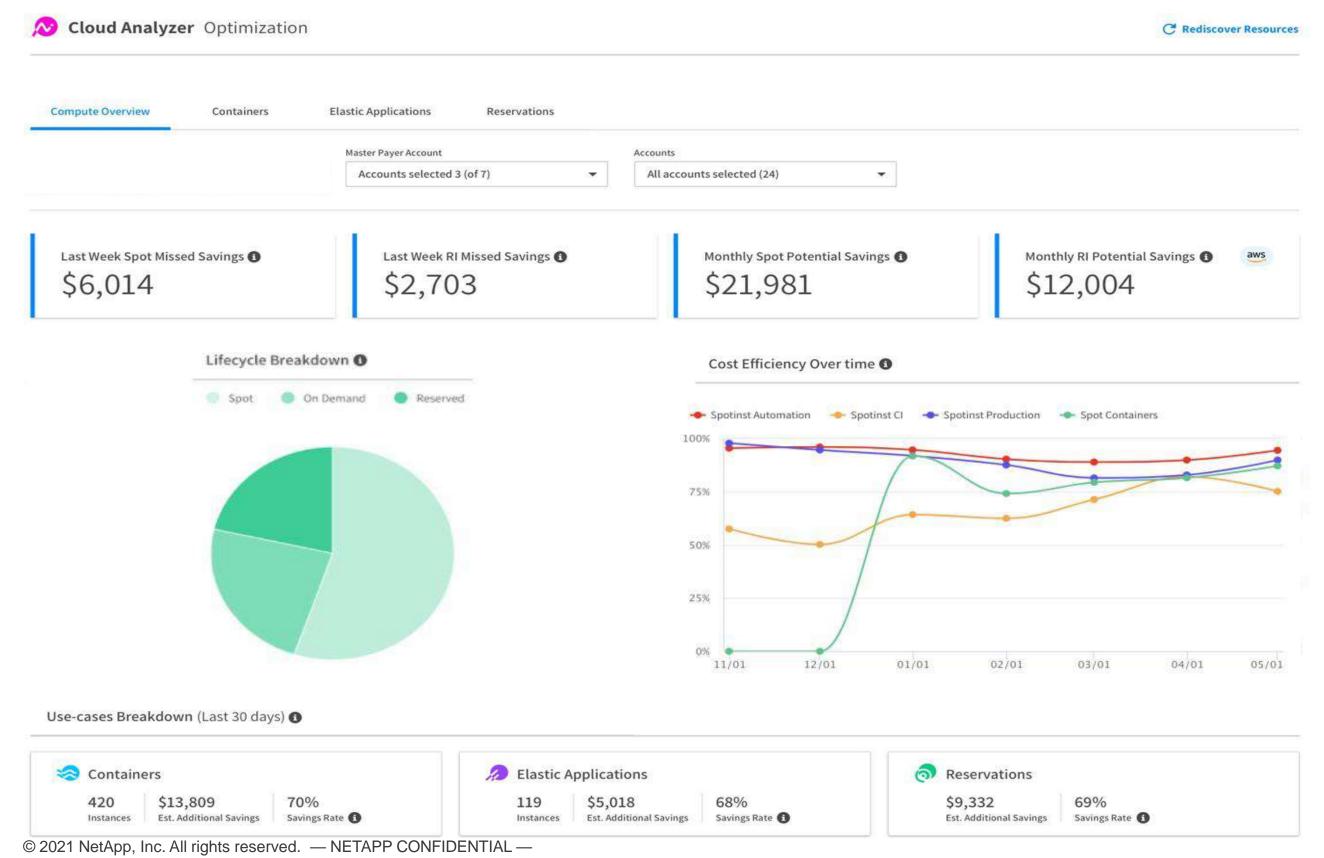
Gain comprehensive operational insights with cost and usage analysis into all your cloud deployments

Report on BU, Accounts, Service, Regions and more

Forecast spend across the coming weeks and months

Target services and accounts where you are missed savings

Optimization

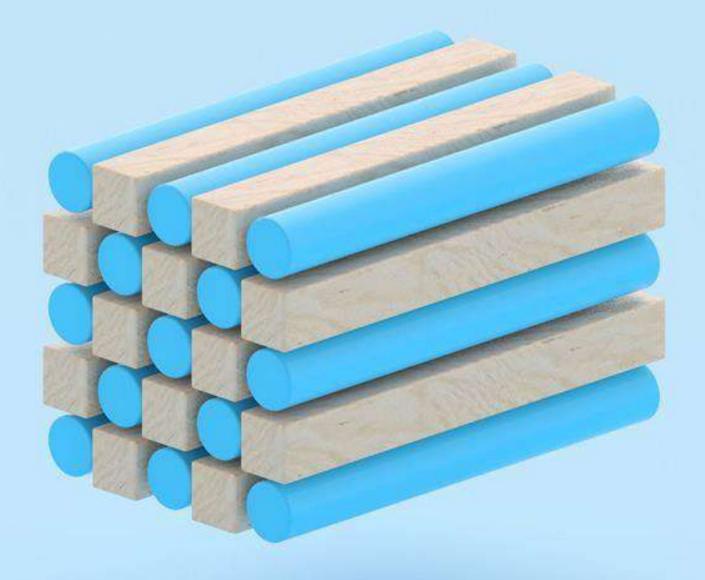


Receive actionable cost and usage optimization recommendations that you can implement and automate with the click of a button

Discover your cloud efficiency KPI and track the feedback loop of your optimization actions over time.

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No Engineering Effort

Reserved capacity is a billing construct, engineers don't have to change anything about the compute or applications they use today.

Eco will continually track usage and build forecasting models to constantly manage the lifecycle.





Diversify Commitment

Eco acts as a reservations broker, utilizing the Marketplace, mix and match commitment lengths from 2-36 months so that utilization will be optimal with as little commitment as possible.





h

Automated Commitment Management



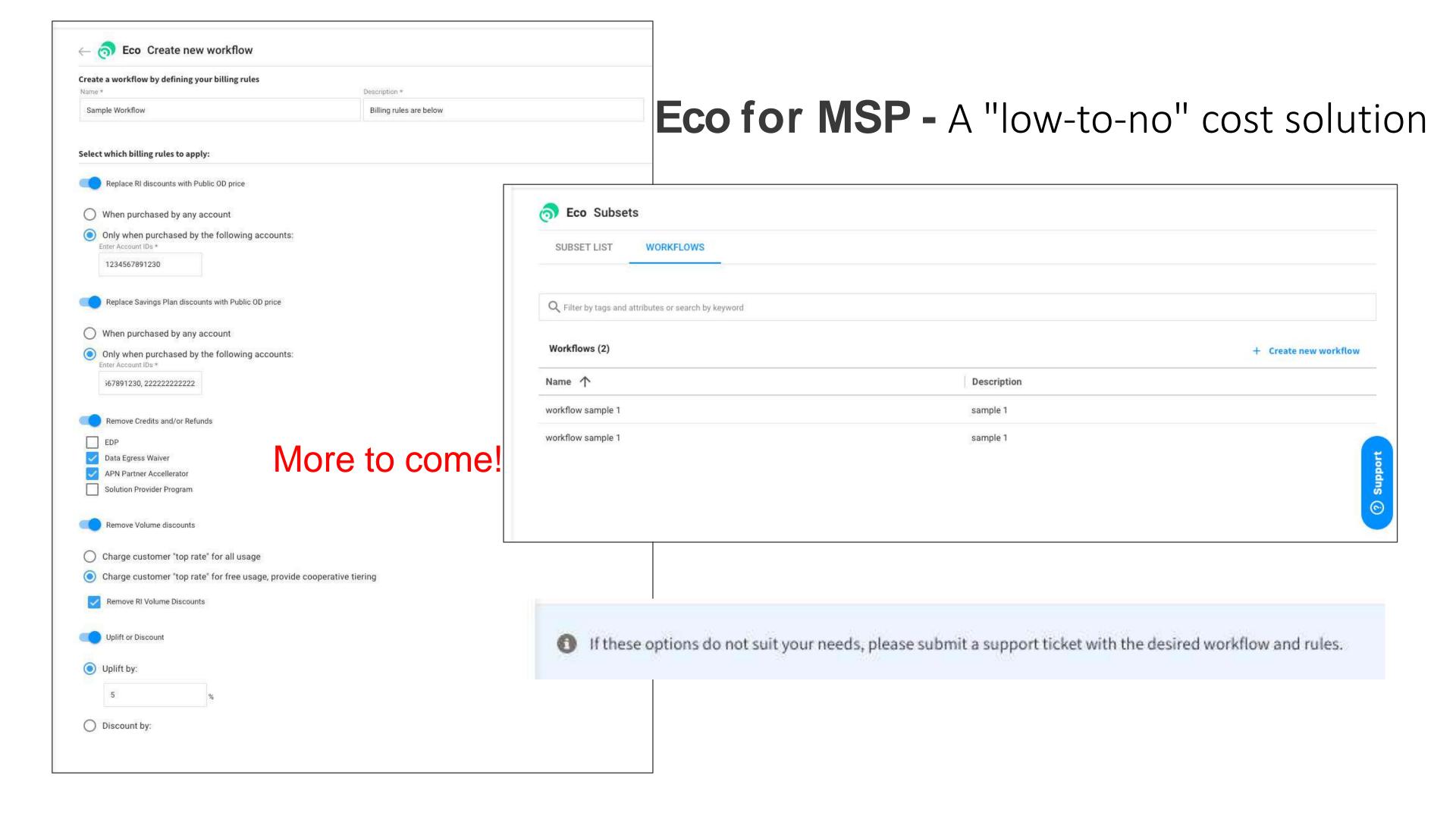
Building a sophisticated strategy

Comprehensive analysis of cloud usage and automatic fitting of capacity & reservations including:

Reserved Instances
Savings Plans

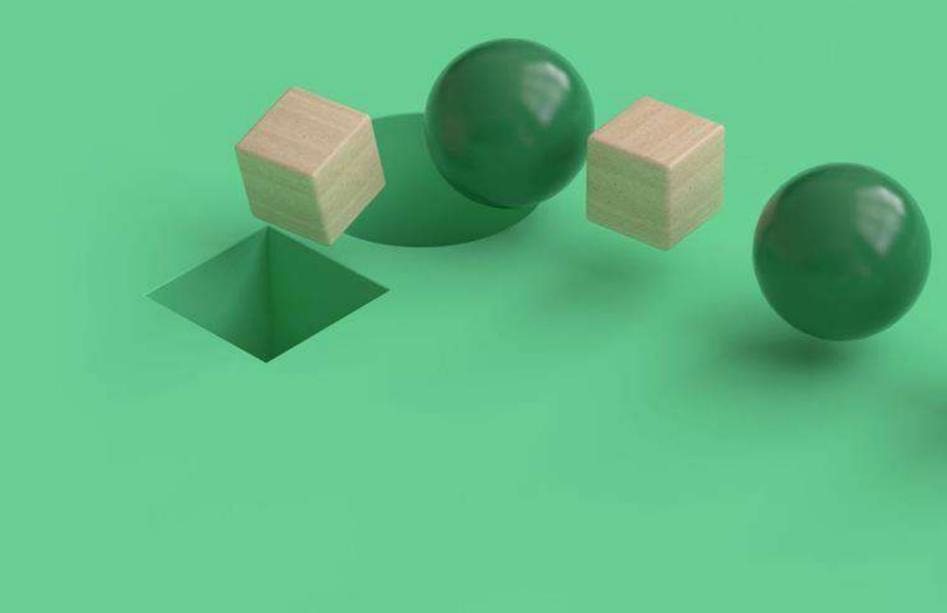
Eco buys and sells capacity in the AWS Marketplace and to NetApp internal pool of >1500 customers, to provide liquidity for unused capacity

With Active management, organizations can see an order of a magnitude more savings in the AWS Cloud.





Your Containers. Zero Infrastructure Management





Your Containers. Zero Infrastructure Management



Container right sizing and observability

Monitor and analyze container utilization and modify in runtime their resource limitations for performance at lowest cost

Container driven auto scaling

Instance size, type & pricing is determined based on pod/container specifications while honoring labels, taints, tolerations, network and storage requirements.

Infrastructure provisioning & pricing

Automated infrastructure management that leverages cloud compute pricing models (spot, on demand and reserved instances) with an enterprise-level SLA for cost savings and dependable performance.





Serverless Containers

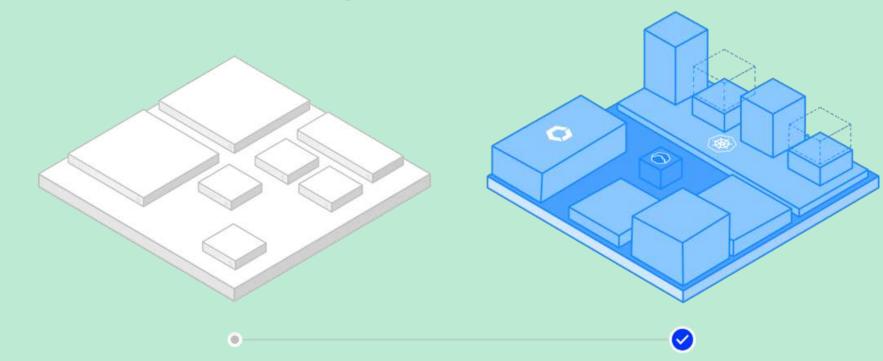
Container-Driven Autoscaling

Auto-detect Pod or Task infrastructure requirements so the appropriate instance size or type will always be available.

Simplify Operations

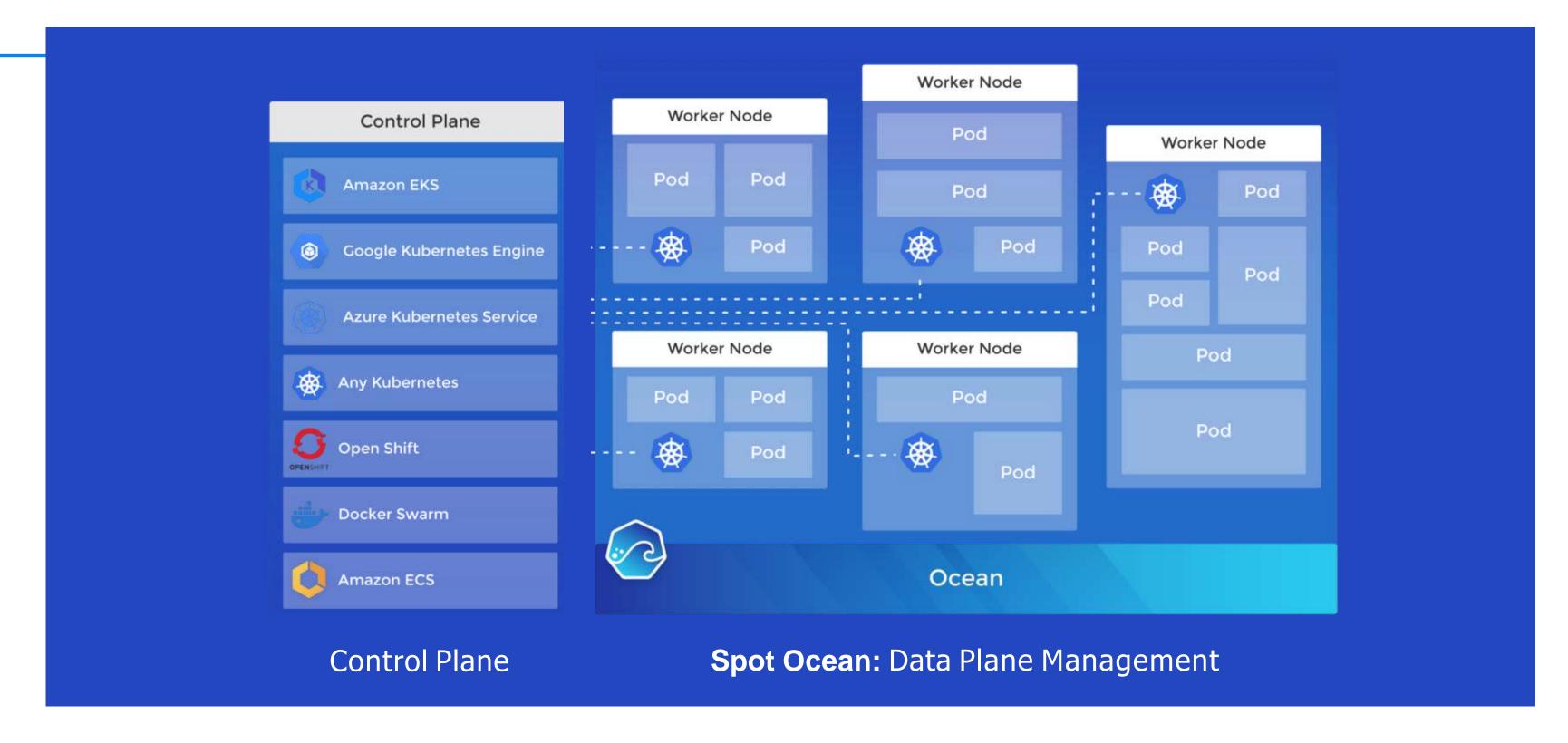
Deploy more without having to manage all the details of the underlying container infrastructure.

Deploy containers on abstracted infrastructure, with up to 90% cost optimization.





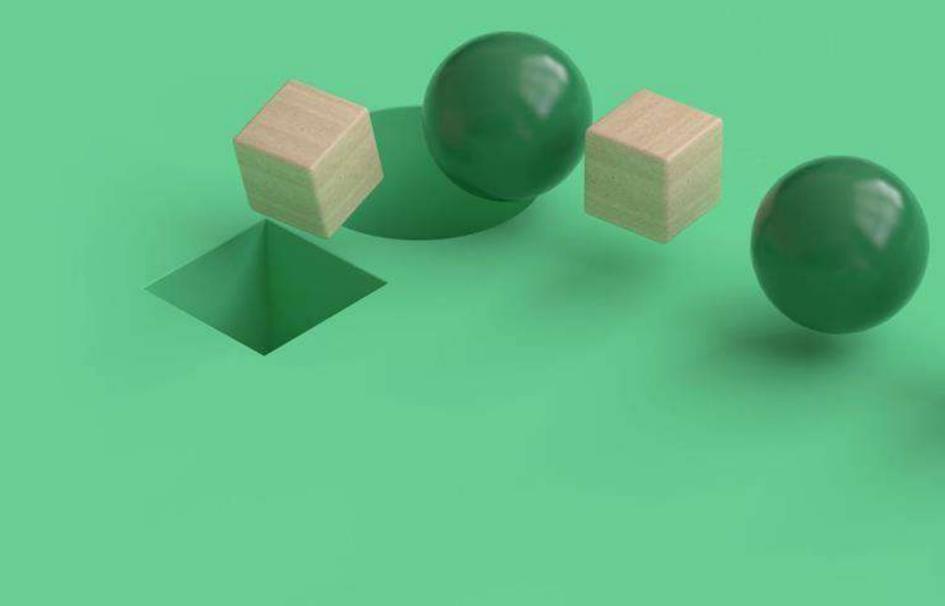
Serverless Containers







Automate All Your Application Workloads





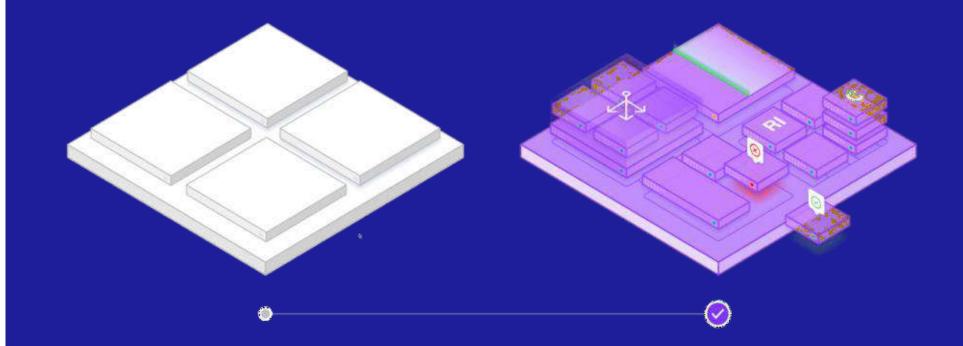
Optimize Costs

Reliably leverage Cloud Excess Capacity to optimize cost and save up to 90% on compute infrastructure across all major cloud providers.

Simplify Operations

Scale, manage and accelerate workloads without the complexity and risk of manually managing your infrastructure.

Automate any application workload, with up to 90% cost optimisation.







Prediction is the Key

Elastigroup predicts Spot Instances behavior, capacity trends, pricing and interruptions rate.

Up to 90% Cost Optimisation with SLA

By predicting interruptions and fluctuations Elastigroup is able to offensively rebalance clusters to prevent interruption.





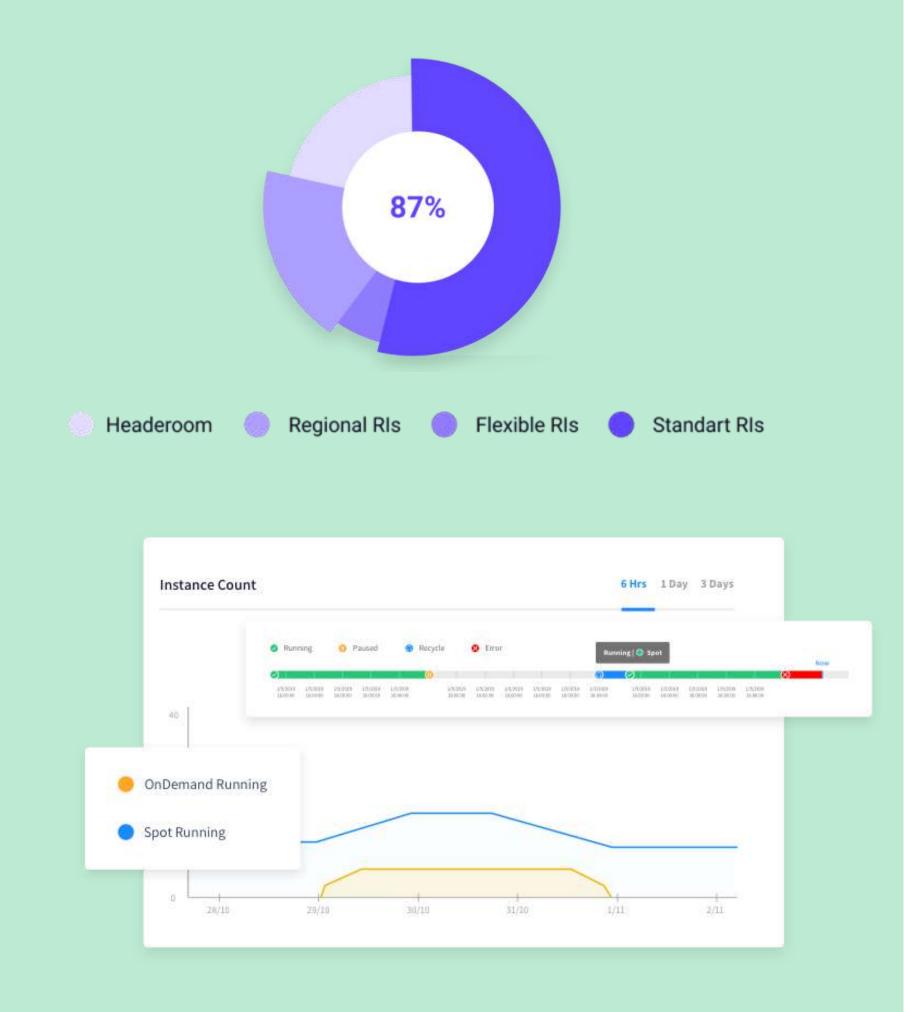


Utilize Reserved Instances

Prioritize all underutilized Reservations across your accounts and apply Reservations discount usage prior to launching Spot or On-Demand Instances.

Enterprise-grade SLA

In the event where Spot Instances aren't available, Elastigroup will automatically fallback to On-Demand Instances and will revert back to Spot Instances whenever possible, all while persisting your storage, network configuration, and state.



Thank you!

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