Real-Time Visibility and Monitoring

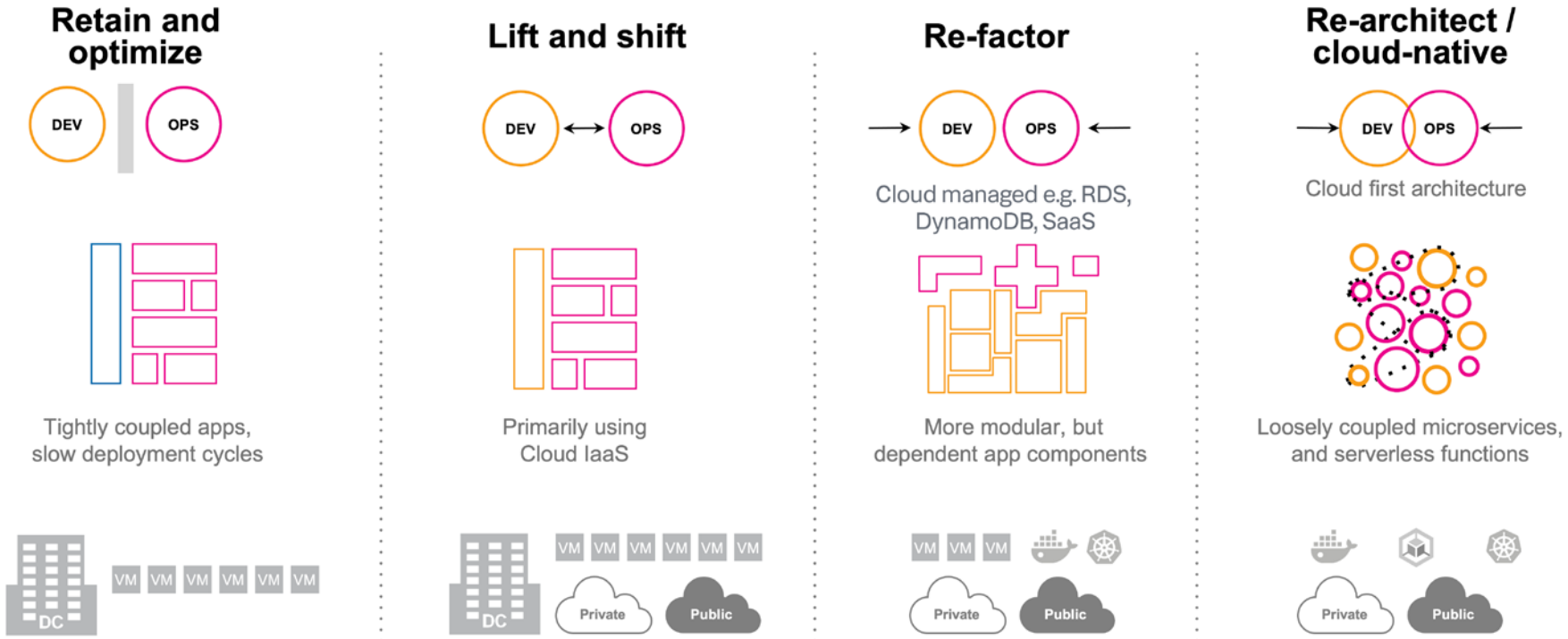
splunk> | Google Cloud

The Cloud journey

The cloud has become essential to modernizing IT and enabling digital initiatives for organizations large and small. As such, organizations are taking on the cloud journey, looking to accelerate innovation, increase efficiency and optimize IT spend.

Cloud migrations typically start by **lifting and shifting** existing workloads to the cloud. However, merely shifting applications and data from on-premises infrastructure to cloud platforms in a bulk cloud migration does not unlock the full potential of the cloud. Companies also need to **refactor** their applications, for example, by leveraging managed cloud services such as Google Cloud Datastore instead of maintaining their own NoSQL database. Furthermore, as companies mature in their cloud journey and **re-architect** their applications to microservices as well as embrace modern infrastructure such as containers, Kubernetes and serverless functions, they stand to gain more benefits.

While the cloud provides agility, efficient scalability and resilience, it also introduces operational complexity. Let's look at an effective framework for monitoring modern infrastructure and services in Google Cloud with Splunk Infrastructure Monitoring.



What's changed in the cloud and why traditional monitoring approaches no longer work

As organizations continue on their journey towards being cloud-native, the volume of operational data they must deal with is significantly greater and more difficult to process. Cloud enables practically unlimited scalability with elastic and automatic provisioning of resources. However, the elastic nature of modern infrastructure also means that the individual components are often ephemeral and dynamic.

Ephemeral infrastructure and the distributed nature of cloud applications exponentially increase the cardinality of performance metrics as well. Frequent application releases add to the complexity of troubleshooting. Traditional monitoring tools cannot make sense of data coming from disparate sources in real time, leading to higher mean-time-to-detect (MTTD) and mean-time-to-resolution (MTTR).

End users' expectations have never been higher. Applications need to provide a flawless end-user experience irrespective of the pressures placed on the system by varying load, sudden changes in traffic patterns or other variables associated with scaling across devices and geographies. According to a recent study by Akamai, a 100-millisecond increase in latency can reduce conversion rates by 7%.[1] Companies often fall short if they retrofit traditional monitoring tools and strategies in modern cloud environments. What they need is real-time observability to gain insights on how their entire system is performing before the end user is affected.

Complex Interdependencies

- 10s or even 100s of loosely coupled, polyglot microservices
- System behavior is unpredictable and changes over time

Elastic, Short-Lived Infrastructure

- Multi-cloud, abstracted infrastructure is extremely dynamic
- Voume of objects and metrics to monitor skyrockets

Frequent Application Changes

- Multiple app release daily, weekly or even monthly
- No single user has an accurate mental model — troubleshooting is a team sport

1. Akamai Online Retail Performance Report: Milliseconds Are Critical, April 19, 2017

Modern approaches to monitoring

Monitoring is an integral part of the DevOps toolchain that enables developers and operations teams to quickly detect, triage, troubleshoot and resolve performance issues — before such issues can impact end users.

The core features of a modern monitoring platform are outlined below:

Real-time Problem Detection

Because modern software-defined infrastructure spins up and down within minutes, every second counts in delivering a flawless end-user experience. The ability to instantly discover and accurately alert on anomalies is now imperative.

Auto Discovery and Integrations

The monitoring platform should be able to automatically discover applications or Google Cloud services and provide pre-built curated visualizations. Out-of-the-box monitoring of every layer of infrastructure allows DevOps teams to correlate metrics across systems to understand the interdependencies between services.

Accurate Alerting

Even traditional and simplistic monitoring tools can fire off an alert when a metric crosses a static threshold. But such static alerting approaches are not adequate in constantly changing, ephemeral cloud environments. An advanced monitoring approach provides sophisticated alerting capabilities including dynamic baselines, automatic outlier detection and sudden changes leveraging AI and ML.

High Cardinality Analytics

Ephemeral cloud infrastructure and the distributed nature of cloud-native applications exponentially increase the cardinality of performance metrics. Tagging and labels are the basic tenets in cloud architectures to aggregate, segment, slice-and-dice data and get meaningful insights. Traditional tools struggle to provide high cardinality analytics at scale in real time.

Monitoring-as-a-Service

The DevOps paradigm of “you build it, you own it” boosts agility in part by decentralizing operational responsibility to individual teams. More people across the organization now need access to monitoring, and this decentralization can easily lead to fragmented tools and data. Fragmentation can lead to higher costs and, even worse, highly inefficient operations. Most monitoring tools were designed for a world in which operations were the responsibility of a small group of experts and lack the necessary capabilities to enable monitoring-as-a-service.

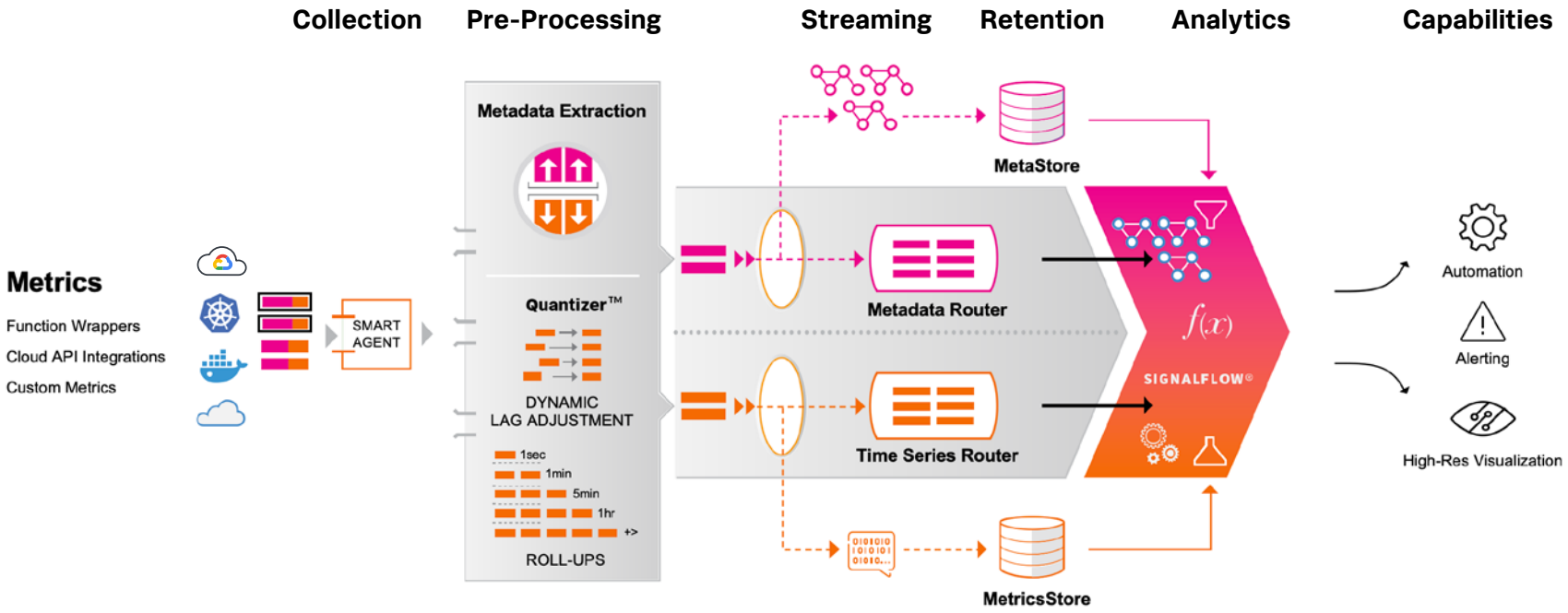
Modern monitoring platforms provide centralized management so teams and users have access controls, and can gain transparency and control over consumption — allowing for better collaboration.

Splunk Infrastructure Monitoring: how it works

Real-time Streaming Architecture

Splunk Infrastructure Monitoring is the industry's leading real-time metrics solution purpose-built to monitor ephemeral clouds, containers and serverless environments with high cardinality at massive scale. Driven by our patented streaming architecture, our approach to ingest, store and retrieve data is fundamentally different from traditional batch- and query-based solutions.

As metric data streams into Splunk, metadata is separated from metric value data as they serve separate use cases. Human-readable metadata is a central tenant in cloud-native environments to search, filter, sort and group, while metric values are analyzed and directly streamed to components such as dashboards, alerts and automation. Our streaming architecture allows customers to get insights and take action in real-time — dashboards refresh, alerts fire and automation tasks trigger all within seconds — whereas other solutions in the industry take painfully longer.



Accurate and sophisticated alerting

Splunk Infrastructure Monitoring provides point-and-click machine learning capabilities to create accurate alerts, helping to avoid alert storms.

Sophisticated algorithms such as Historical Anomaly, Sudden Change and Resource Running Out go beyond alerting on static thresholds and evaluate conditions, alerting you only when there is a true anomaly. In addition, there are more than 20 built-in statistical functions to ensure alert accuracy by not only looking at the raw metric data but also evaluating trends and patterns.

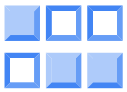
Deep visibility into Google Cloud services

Monitor your entire Google Cloud environment in one place. Splunk Infrastructure Monitoring seamlessly integrates with Google Cloud and provides out-of-the-box visibility into Google Cloud and your services.

App Engine

BigQuery

Cloud Bigtable



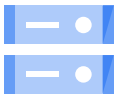
Datastore

Cloud Functions

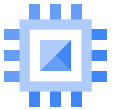
Google Cloud Platform

Pub/Sub

Cloud Spanner



Cloud Storage



Compute Engine

Container Engine

Operations Suite

Cloud Run

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Open and flexible data collection

Splunk provides complete flexibility and choice to ingest data from Google Cloud environments:

Cloud APIs: Seamless integration with Google Cloud Monitoring and Logging to ingest data from Google Cloud-managed services such as Cloud Datastore, Cloud Spanner, Bigtable, Cloud Storage and many others.

Splunk Infrastructure Monitoring Smart Agent: Open-source host-based agent to automatically discover compute services such as Google Kubernetes Engine (GKE) or Compute Engine as well as deployed application services such as MongoDB, Cassandra, Nginx and many others.

Istio Service Mesh: Out-of-the-box visibility into application performance using a seamless integration with Istio.

Google Cloud Functions: Using Function Wrappers, DevOps teams can automatically ingest serverless platform performance metrics in real time and easily understand the performance, usage and bottlenecks across the entire serverless environment.

Knative / Cloud Run Integration: Splunk Infrastructure Monitoring provides end-to-end visibility to the entire Knative stack — Kubernetes platform, Istio service mesh, and Knative workloads all via a unified, single solution.

Splunk Infrastructure Monitoring Smart Agent

Instantly discover deployed application and services as well as host, container metrics with open source Smart Agent

Google Cloud's Operations Suite

Monitor, troubleshoot, and improve application performance on your Google Cloud environment.

Istio Service Mesh

Get out-of-box visibility into the performance of your complex microservices architectures.

Google Cloud Functions

Functions wrappers to get real-time visibility into performance characteristics of Google Cloud Functions

OpenTelemetry Collector

Open source, vendor-agnostic implementation to ingest telemetry data

Kubernetes Navigator: real-time monitoring and AI-driven analytics for Google Kubernetes Engine (GKE) and Anthos

Kubernetes Navigator is the easiest way for DevOps and site reliability engineering (SRE) teams to understand and manage the performance of containerized applications using an intuitive, out-of-the-box UI that provides visibility throughout the entire Kubernetes environment.

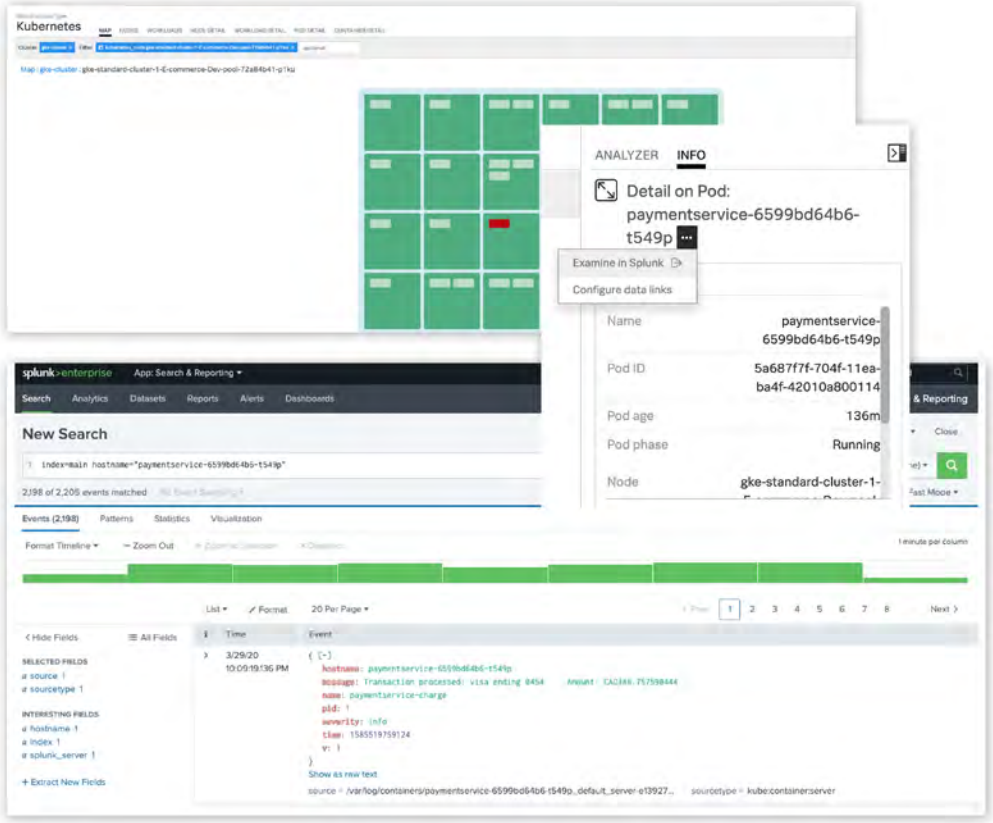
With Kubernetes Navigator, teams can detect, triage and resolve performance issues faster than ever before. DevOps and SRE teams can successfully navigate the complexity associated with Kubernetes at scale by taking advantage of these features:

Dynamic Cluster Map: An intuitive way to instantly understand the health of Kubernetes clusters

Drill-downs: Faster and effective troubleshooting with quick drill-downs

Logs in context: Deep linking to contextual logs to gain granular insights, eliminate context switching and accelerate root cause analysis

Kubernetes Analyzer: AI-driven analytics to automatically surface recommendations and expedite troubleshooting



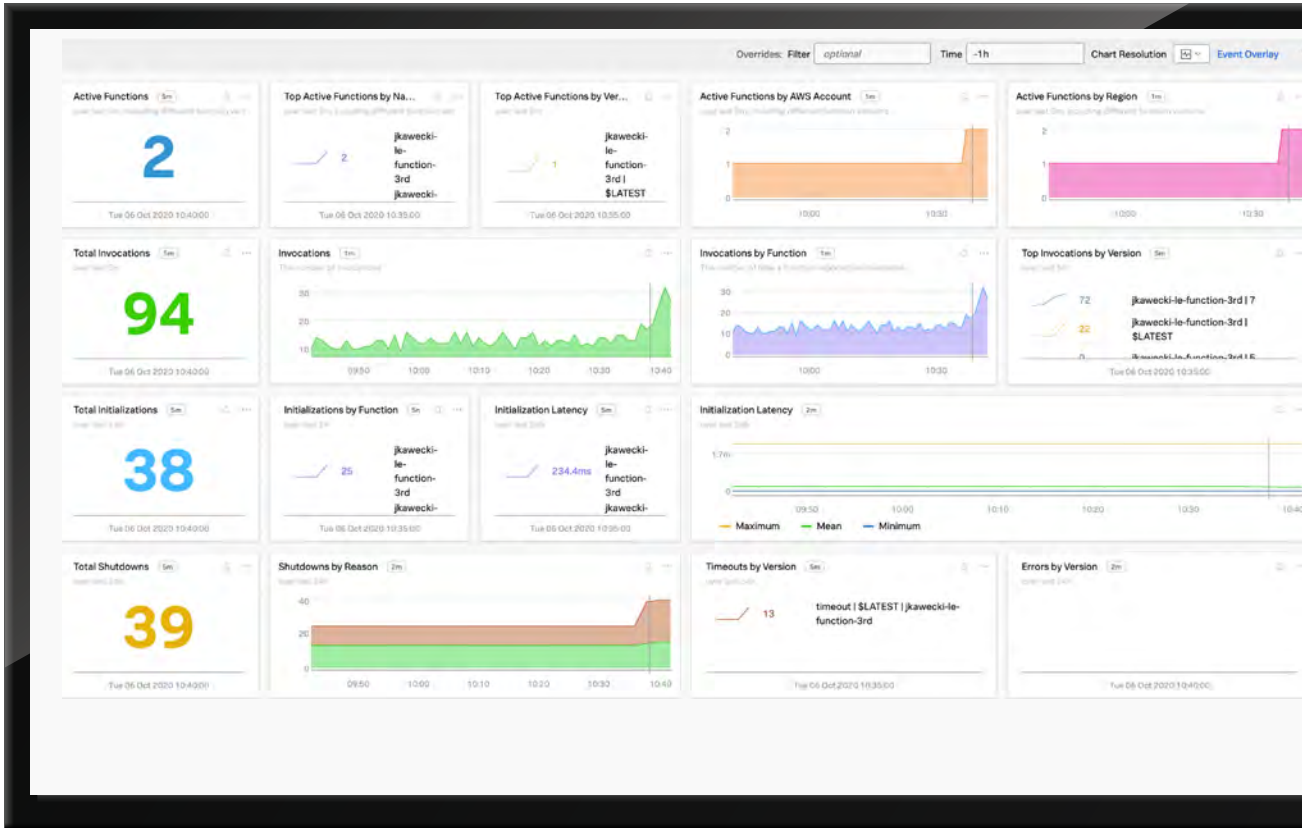
Real-time visibility into Google Cloud Functions and Cloud Run

Whether your applications are 100% serverless or a mix of serverless and traditional apps, you can monitor your entire cloud stack with Splunk in real-time.

Use functions wrappers, Istio service mesh and seamless Prometheus integration to get comprehensive, end-to-end visibility.

Monitor key business performance metrics

Splunk function wrappers provide an easy mechanism to instrument your code for custom metrics that matter, e.g., business KPIs. Simply add a few additional lines within your function to capture and send those metrics to Splunk without incurring any performance overhead.



Future Growth and success begins with modernizing infrastructure: start your Cloud Journey with Splunk and Google Cloud

Modern apps run on modern infrastructure. Our customers partner with Splunk to accelerate their journey to cloud and infrastructure modernization.

Customer outcomes

Learn More

Whether you've just begun embracing the cloud or have already accelerated cloud adoption, future-proof your observability investment with an enterprise-grade solution trusted by leading companies for real-time cloud monitoring.

Get Started

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