



# Good morning, Taipei

November 7, 2018





# 為您的雲端應用程式 偵錯及監測效能

**Isaac Tsai**

Cloud Advisor 雲端顧問

*Google Cloud*



# Debugging and performance monitoring of your cloud apps



# Cloud Devops Mission

Speed and Reliability:  
No compromise.



# Google Formula For App Agility



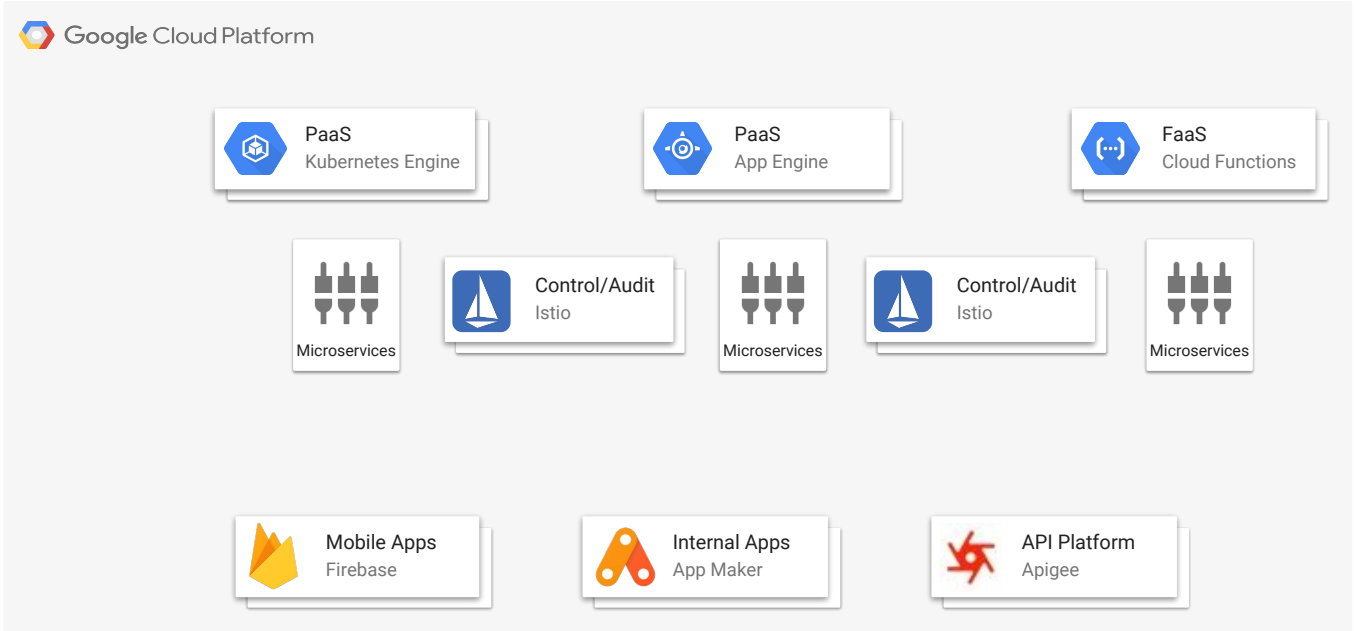
Build  
Container Builder

Track  
Container Registry

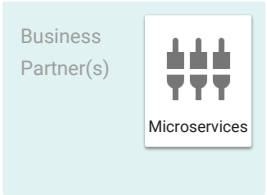
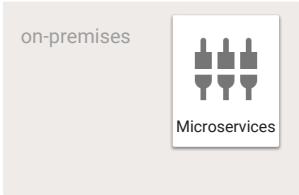
Store  
Cloud Storage

Deploy  
Spinnaker

Monitor  
Stackdriver



Google Cloud



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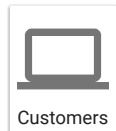
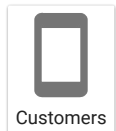
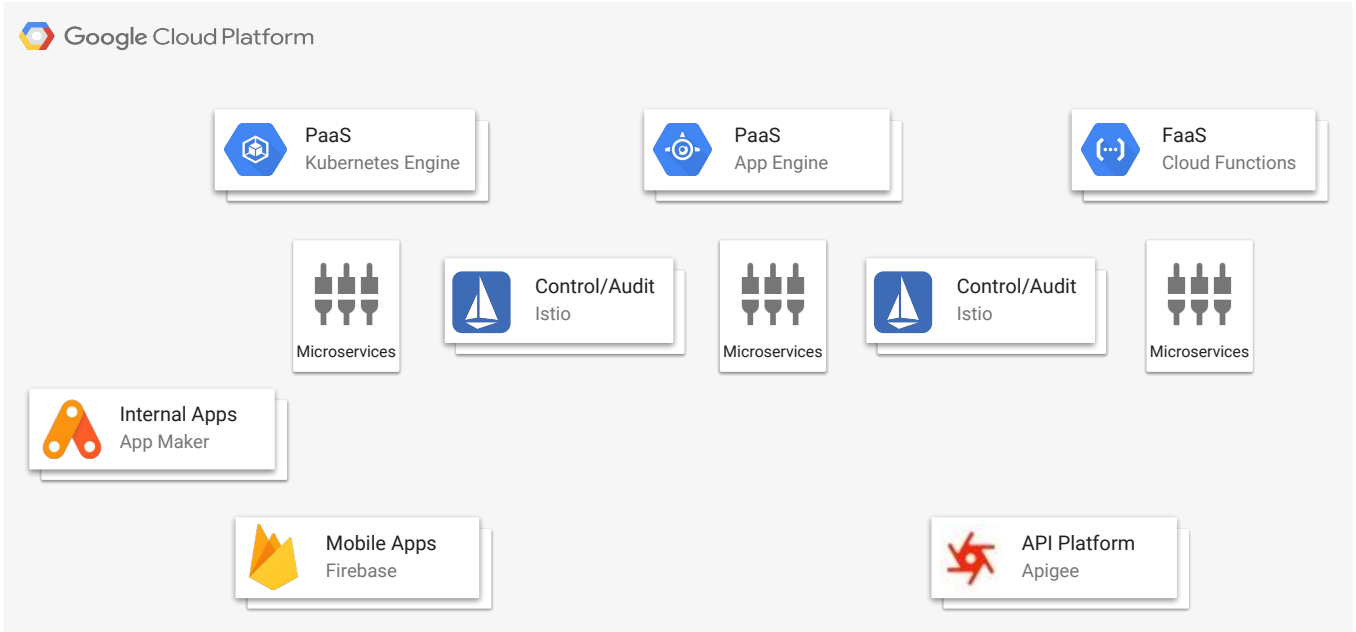
**Build Stuff**  
Container Builder

**Track stuff**  
Container Registry

**Store Stuff**  
Cloud Storage

**Deploy Stuff**  
Spinnaker

**Monitor**  
Stackdriver



on-premises

**Microservices**

Business Partner(s)

**Microservices**

# IT Operations - Now And In The Future

Meet customers where they are ...

- Traditional IT
- DevOps
- SecOps
- Developers

... and empower customers to adopt **SRE** practices



# What We Learned From SRE

Google Cloud





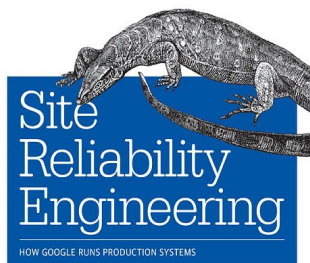
# 1 Billion Users

# What Google Provides

## Infrastructure



## Practices



## Tools



# SRE practices



## Metrics & Monitoring

- SLOs
- Dashboards
- Analytics



## Capacity Planning

- Forecasting
- Demand-driven
- Performance



## Change Management

- Release process
- Consulting design
- Automation



## Emergency Response

- Oncall
- Analysis
- Postmortems



## Culture

- Toil management
- Engineering alignment
- Blamelessness

# Stackdriver

Stackdriver is a SaaS ops suite from Google that is used by app **developers & operators to monitor & troubleshoot** applications running on GCP, AWS, and cloud native infrastructure, wherever it is hosted

Stackdriver's mission is to help developers and operators **keep their hybrid & multi-cloud apps fast and available**



Google Cloud Platform





# Stackdriver

**Stackdriver is a broad suite of products offered to customers to **improve the development experience on GCP****

**Monitoring** (acquired): stats, dashboards, alerts

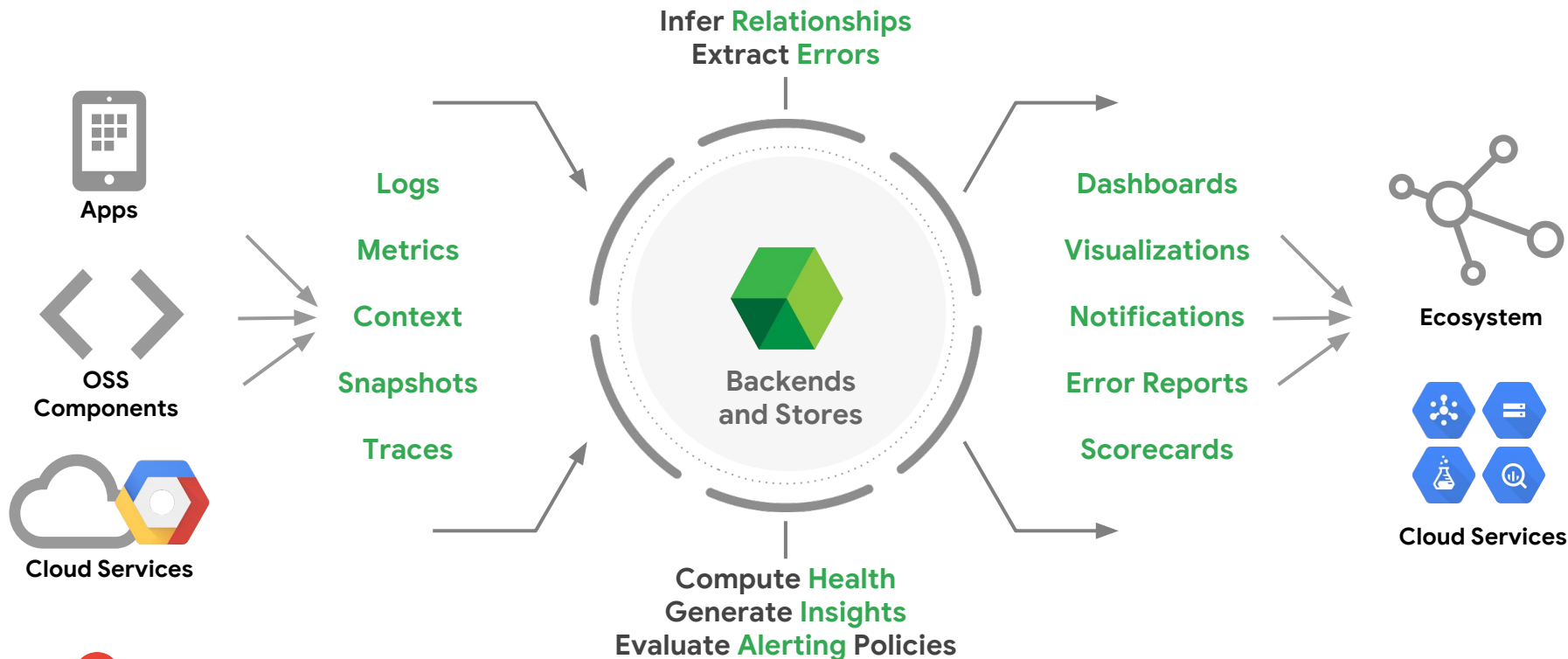
**Logging**: logs ingestion, analysis, error reporting

**APM**: distributed tracing, debugging, profiling

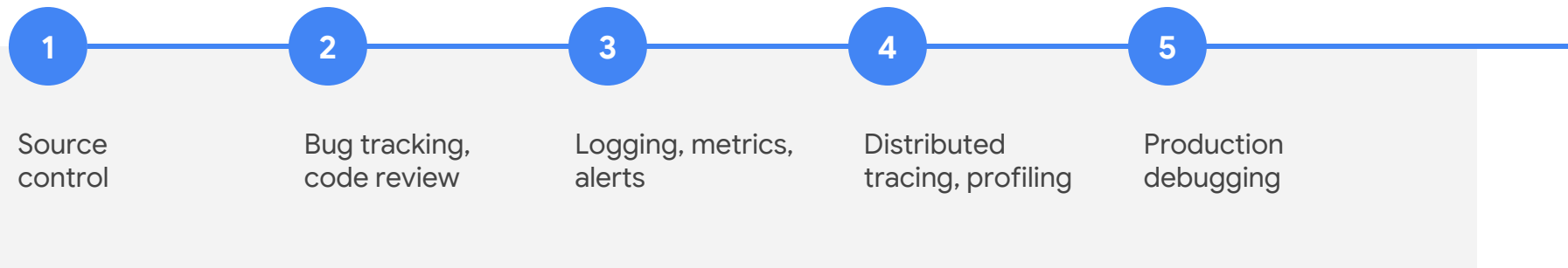


Google Cloud

# 30,000' Stackdriver Architecture



# Developers are raising the bar



# Today's Discussion

[Stackdriver APM](#): giving the next wave of service developers tools to manage reliable, performant apps

Composed of [three products](#):  
Stackdriver Profiler, Debugger, Trace

[Tools that unlock](#) the methodologies honed at Google to GCP customers and the broader market

Can be [used on applications running anywhere](#), not just on GCP



# What's Included

## Stackdriver Trace

**Distributed Tracing:** visualize real customer requests traveling across services

- Understand service topology and how certain requests are routed
- Determine the causes of latency, reduce it
- Google pioneered this space with Dapper

## Stackdriver Profiler (Beta)

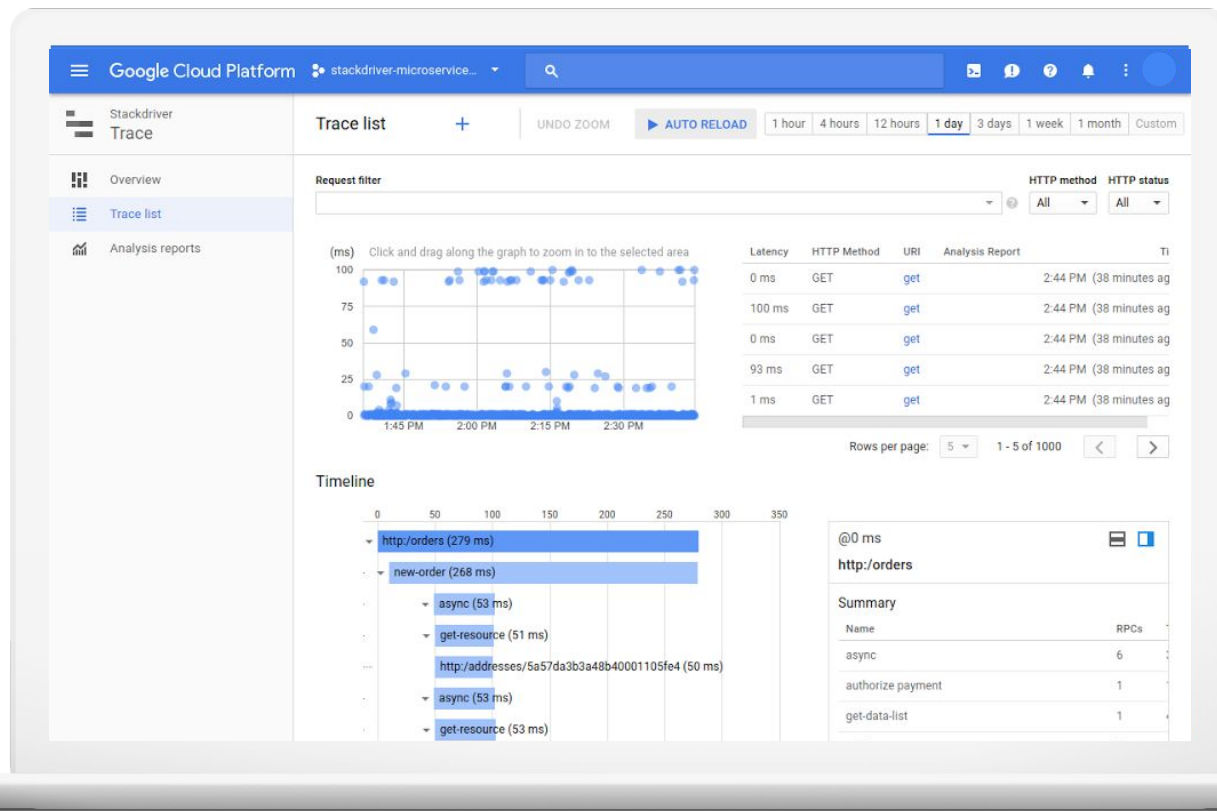
**Continuous Profiling:** what's the production impact of the code that I just wrote?

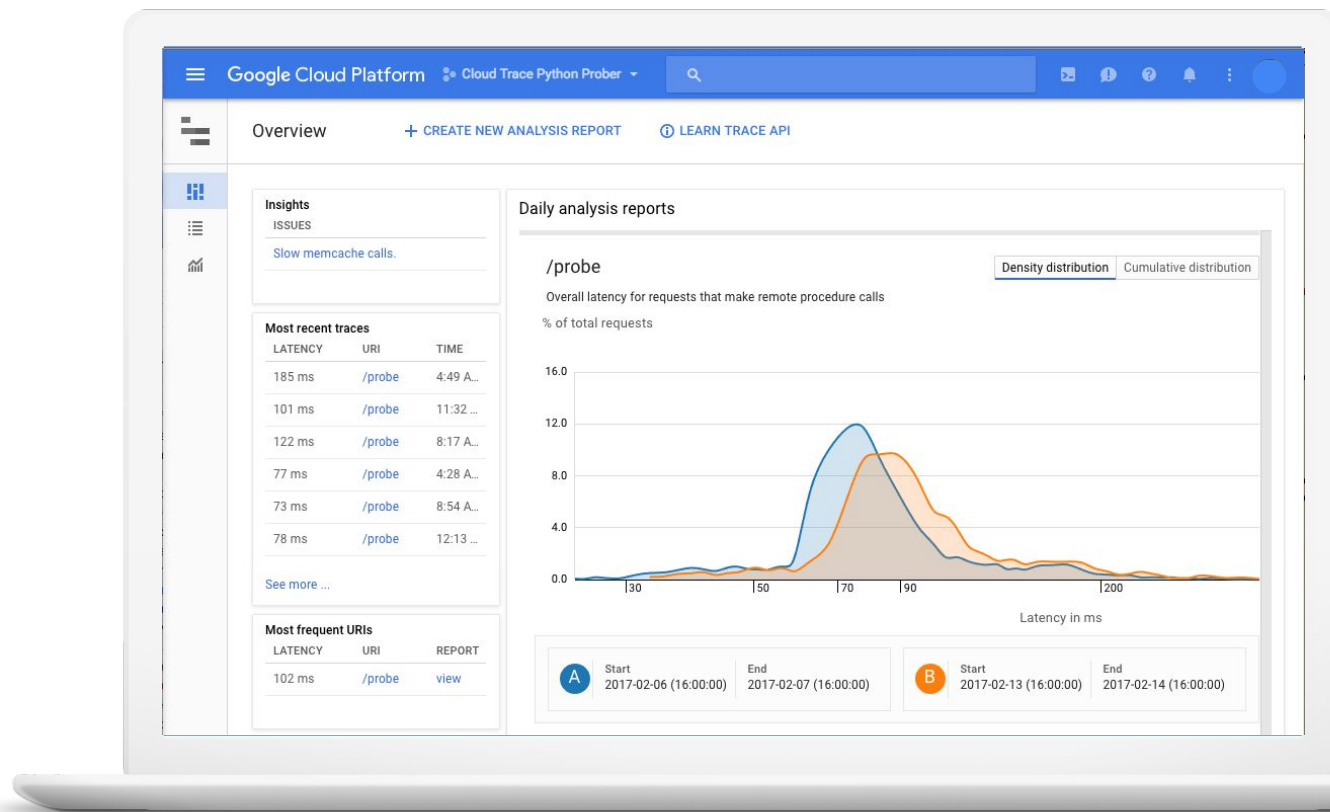
- Understand actual call patterns (fn. a calls fn. b) for real workloads
- Discover how much CPU or memory each function uses
- Improve performance and reduce your costs

## Stackdriver Debugger

**Production Debugging:** safe, fast, intuitive production root cause analysis

- Create production breakpoints that don't halt execution
- Dynamically add log statements to code, without redeploying
- All from an intuitive IDE-like interface





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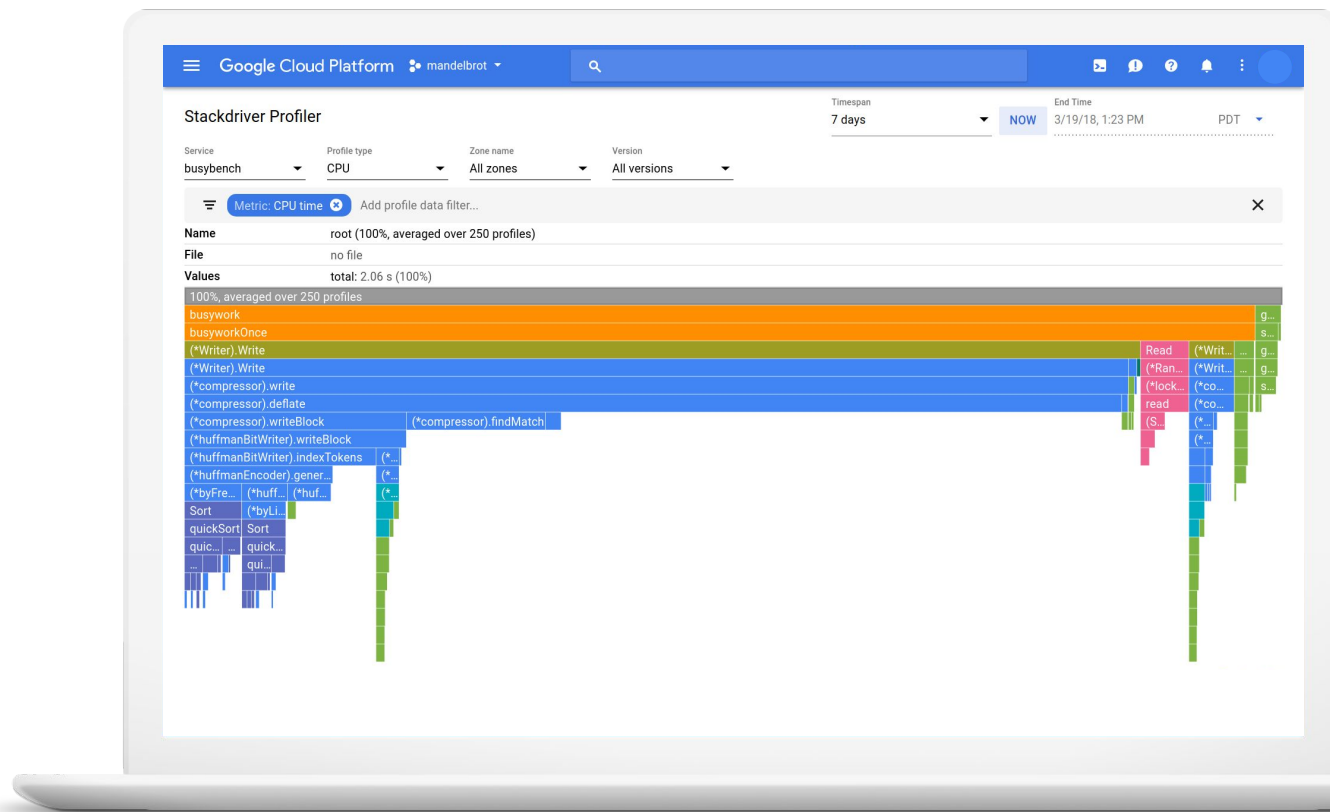
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☰Google Cloud Platformstackdriver-microservices...

Stackdriver

Debug

sockshop - unversioned

WHAT'S NEW

index.js

Type a file name

```
50 helpers.respondStatus(res, response.statusCode);
51 });
52 });
53
54 // Add new item to cart
55 app.post("/cart", function (req, res, next) {
56   console.log("Attempting to add to cart: " + JSON.stringify(req.body));
57
58   if (req.body.id == null) {
59     next(new Error("Must pass id of item to add"), 400);
60     return;
61   }
62
63   var custId = helpers.getCustomerId(req, app.get("env"));
64
65   // STACKDRIVER-DEMO: Sneaky performance-slowing function
66   if (req.body.id.endsWith('b')) {
67     setTimeout(function() {
68       async.waterfall([
69         function (callback) {
70           request(endpoints.catalogueUrl + "/catalogue/" + req.body.id, function (error, body) {
71             console.log(body);
72             callback(error, JSON.parse(body));
73           });
74         },
75         function (item, callback) {
76           var options = {
77             uri: endpoints.cartsUrl + "/" + custId,
78             method: 'POST',
79             json: true,
80             body: {itemId: item.id, unitPrice: item.unitPrice};
81           request(options, function (error, body) {
82             console.log(body);
83             callback(error, body);
84           });
85         }
86       ], function (error, body) {
87         res.json(body);
88       });
89     }, 1000);
90   }
91   return next(err);
92 }
```

SnapshotLogpoint

Click a line number or type file:line to take a snapshot.

Main.java:10

Condition: (Optional)

Type a condition

Expressions: (Optional)

Type an expression

Debug without stopping or slowing down your application

Click a line number to take a snapshot of variables and call stack. Taking a snapshot does not stop the running application.

- Use the condition to scope the result.
- Add expressions to access even more variables.
- [Learn more](#) about Stackdriver Debugger.

The sock shop demo code is provided by Weaveworks, copyright 2017

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OFFER OF THE DAYBuy 1000 socks, get a shoe for free!

LoginRegister

weaveworks


HOME

CATALOGUE

Home > Catalogue > Crossed

SALE

NEW



# Crossed

Scroll to product details, material & care and sizing

\$17.32

Add to cart

Add to wishlist

Product details

A mature sock, crossed, with an air of nonchalance.

Material & care

- Polyester
- Machine wash

Size & Fit

- Regular fit

Add more socks, you need more socks!

# Key Benefits



Debugger snapshots and dynamic log statements **remove multiple deployment steps from root cause analysis iteration cycles.**



**Profiler operates at extreme scale** and isn't limited to analyzing single transactions. It can detect slow memory leaks and reduce costs.



Tracing tools tend to be **expensive or difficult to adopt.** Stackdriver Trace isn't.



Google Cloud



# Commitment to Open Source

Our instrumentation:

- Is [Apache-licensed OSS](#) on GitHub
- Exposes APIs so that [developers can capture custom data](#)

Traces and app-level metrics are [captured with OpenCensus](#), a project we're participating in with other vendors



## Stackdriver Trace

**2.5 million free spans per month**

- Lightweight OSS instrumentation
- Works on services running anywhere
- Supports C++, Java, Go, Node.js, .Net, Ruby, Python, PHP



## Stackdriver Profiler

**Free during the beta test period**

- Lightweight OSS instrumentation
- Works on services running anywhere
- Supports Java, Go, Node.js



## Stackdriver Debugger

**Currently free**

- Lightweight OSS instrumentation
- Works on services running anywhere
- Supports Java, Go, Node.js, .Net, Ruby, Python, PHP



We used Stackdriver Profiler as part of an effort to improve the scalability of our services. **It helped us to pinpoint areas we can optimize and reduce CPU time**, which means a lot to us **at our scale.**

Evan Yin

*Software Engineer, Snap Inc.*



Google Cloud

# Summary

An essential toolkit for the  
next wave of developers

Developers can use the  
same tools as Google to  
keep their services fast  
and reliable

Works on services hosted  
on any cloud or on-prem



# Thank you

