



Autocomplete Architecture Options

Dave Murphy
Customer Engineer



Agenda

1. Introductions & Overview
2. Why Google Cloud?
3. Recommended Architecture
4. Demo
5. Alternative Architecture
6. Estimated Costs
7. Discussion & Next Steps

Why Google Cloud?

Productive teams with mobility & devices

G-Suite; Chrome and Android

Connect & grow ecosystems

Ready APIs (Maps, Vision, Translate etc.), Apigee, OrbitEra

Google Cloud

Deliver new apps

App Engine, Kubernetes, Firebase, Cloud Functions

Secure & trusted infrastructure

100+ POPs globally; 600+ security engineers

Turn data into advantage

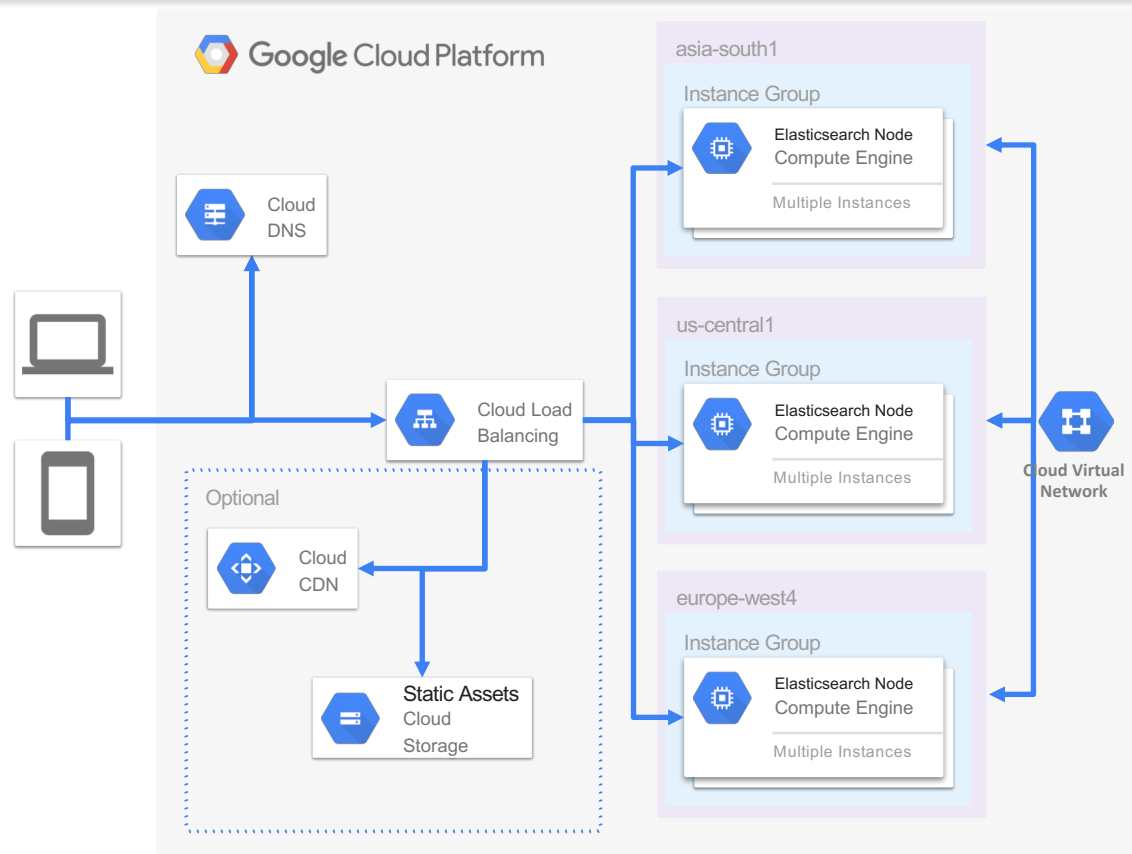
Machine Learning & Data Analytics:
Cloud ML, TensorFlow, BigQuery

Recommended Architecture

Solution Requirements

- 1 Low latency
- 2 Globally distributed
- 3 Large search index (n = millions)
- 4 Open-source preferred

Product Search Autocomplete





Recommended Architecture

Pros

- Scalability
- Extensibility beyond autocomplete
- Trivial to add/remove regions
- Highly available
- Battle-tested solution

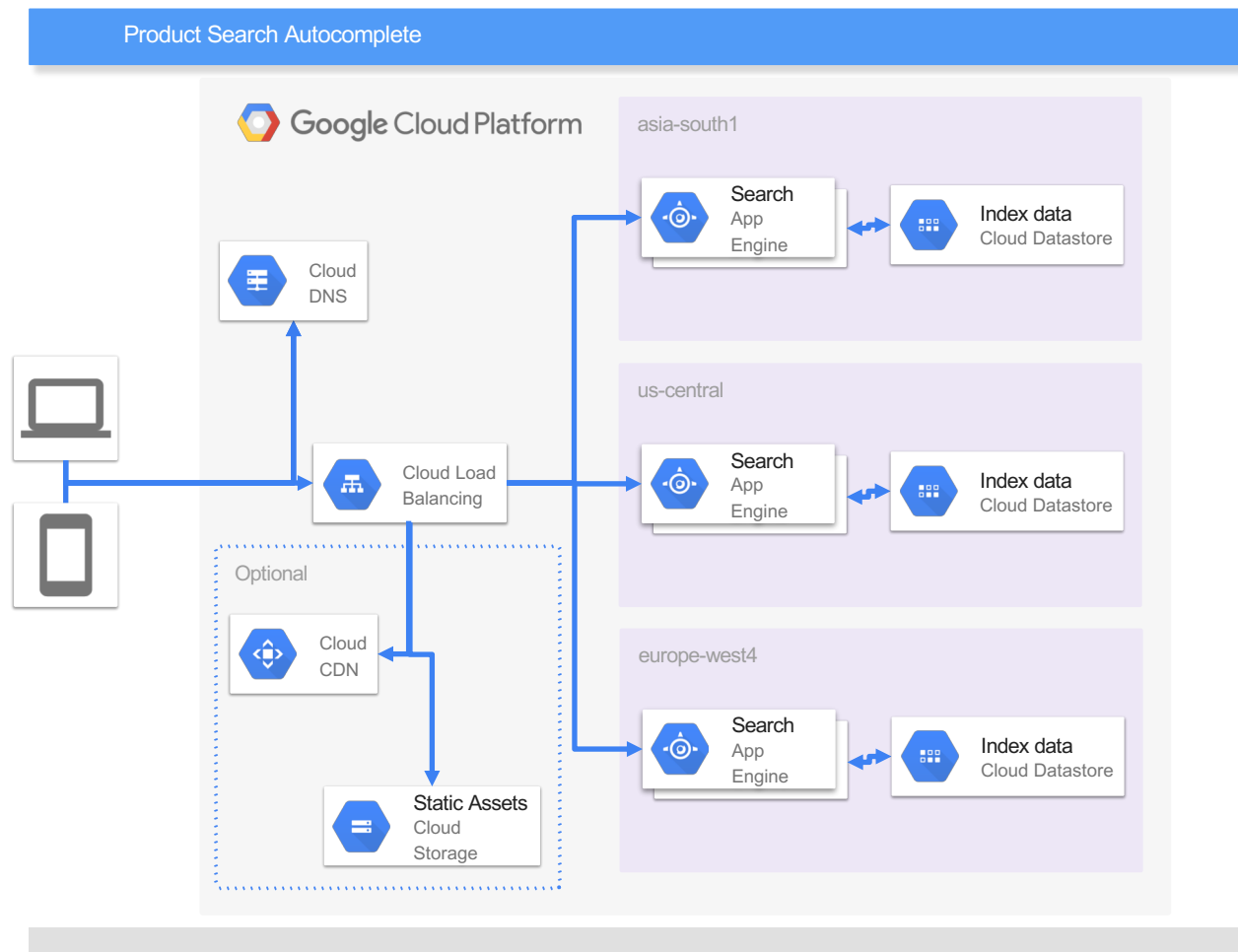
Cons

- Elasticsearch knowledge is required
- Support is commercial & 3rd party

Alternative Architecture

Solution Requirements

- 1 Low latency
- 2 Globally distributed
- 3 Large search index (n = millions)
- 4 Open-source preferred





Alternative Architecture

Pros

- Full application control
- Use preferred language & existing dev resources/processes
- Fully managed components

Cons

- Clustering not included
- Multiple indexes/environments to manage
- Not available in every region
- Support/knowledge in-house only

Estimated Costs

Recommended Architecture

Service	Qty	Monthly	Annual w/ 3 year commit
Compute Engine N1 Standard Instance (1 CPU, 3.75GB)	6	\$150.55 ¹	\$1,236.58
SSD Persistent Disk (100GB per VM)	600GB	\$112.20	\$1,346.40
Global Load Balancing (1 rule, 10GB ingress)		\$18.33	\$219.96
Egress (both client & inter-region)	10GB / region	\$3.60	\$43.20
Cloud DNS	1 zone / 10M queries	\$4.20	\$50.40
<u>Total</u>		\$288.87	\$2,896.54

1: Includes 30% Sustained Use Discount

Monthly: <https://cloud.google.com/products/calculator/#id=ba53974f-f637-4e99-bc20-efc6459dc902>

Annual: <https://cloud.google.com/products/calculator/#id=9d21f2c1-4110-45cc-839a-83b62b300103>

Estimated Costs

Alternative Architecture

Service	Qty	Monthly	Annual
App Engine standard environment instances	6	\$176.44	\$2,117.28
Cloud Datastore (60GB, 30k reads, 10k writes, 10k deletes)		\$5.33 ¹	\$63.94
Global Load Balancing (1 rule, 10GB ingress)		\$18.33	\$219.96
Egress (both client & inter-region)	10GB / region	\$3.60	\$43.20
Cloud DNS	1 zone / 10M queries	\$4.20	\$50.40
<u>Total</u>		\$207.90	\$2,494.78

1: Includes free tier usage

Monthly: <https://cloud.google.com/products/calculator/#id=139b7553-a505-4da5-a1c8-5d6ddfc00776>

Annual: <https://cloud.google.com/products/calculator/#id=b6da12f6-6932-4fdc-8ccf-76db418ae857>



Discussion & Next Steps

Resources

Elasticsearch (code) - <https://github.com/elastic/elasticsearch>

Elastic (company) – <https://elastic.co>

Sample Code - <https://github.com/davemurphysf/ac-demo>

Pricing Calculator

- Recommended Arch Monthly: <https://cloud.google.com/products/calculator/#id=ff07e78b-d200-4c12-87ad-2baeca511c4a>
- Recommended Arch Annual: <https://cloud.google.com/products/calculator/#id=9d21f2c1-4110-45cc-839a-83b62b300103>
- Alternative Arch Monthly: <https://cloud.google.com/products/calculator/#id=139b7553-a505-4da5-a1c8-5d6ddfc00776>
- Alternative Arch Annual: <https://cloud.google.com/products/calculator/#id=b6da12f6-6932-4fdc-8ccf-76db418ae857>