Serverless A2X

Google App Engine as a serverless platform for A2X

. . .

A2X

Easy accounting for Amazon sellers

- monthly subscription SaaS app

- millions of orders from Amazon

- summarize and match data

Scaling: 2 years on App Engine

- < 5 sellers
- $300,000/month
- 1000's of orders

→

- > 5000 sellers
- > $1 Billion/year
- > Millions of orders

No Servers. No Databases.
Same architecture and platform from day one.

What is App Engine?

"If you write your app the way we tell you to, against our API's, we promise it'll scale really well on our platform"

- Google *

What is App Engine?

Design guidelines with App Engine

- Do all your work in the web layer
- Keep no state in the web layer
- Keep all the (user facing) requests short and lightweight
- Shift the heavy/slow work to the background (but still in the web layer)
- Keep result sets small

How does App Engine fit in?

A bit less-serverless

Bare-metal,
colocation,
dedicated

EC2, IaaS

App Engine,
Heroku,
Beanstalk,
PaaS

Lambda,
FaaS
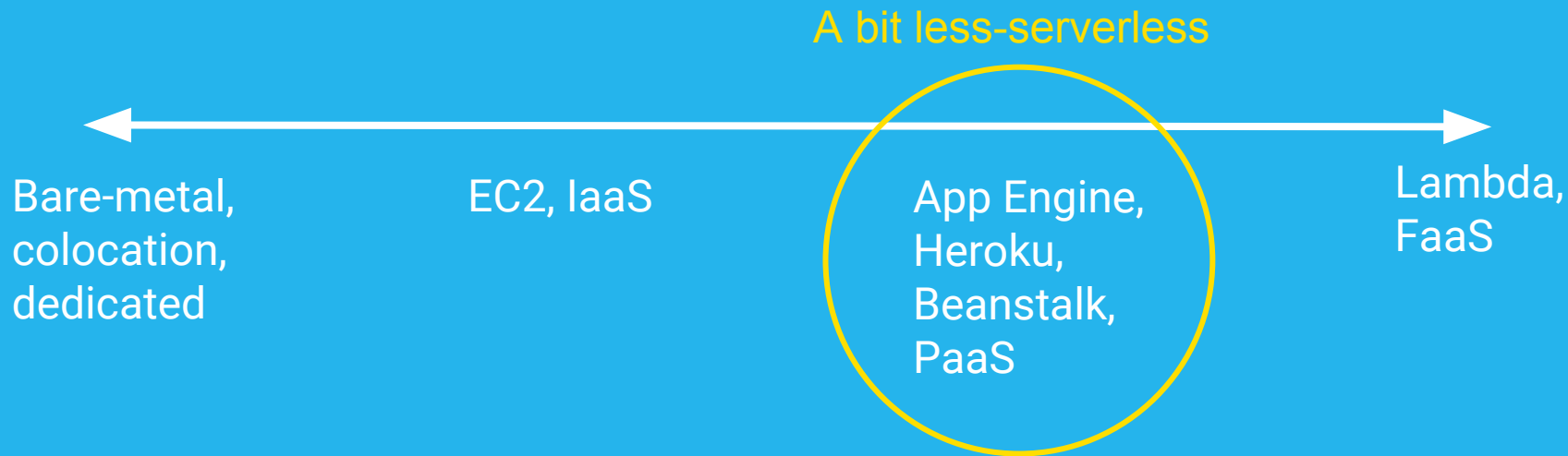
Is App Engine 'Serverless'?

- JVM platform
- Call a method
- With some parameters
- Abstract everything else

- Web app platform
- Service a request
- With some parameters
- Abstract everything else

Web Request as the unit of work

users/API

Background processing

Scaling is here

Tasks

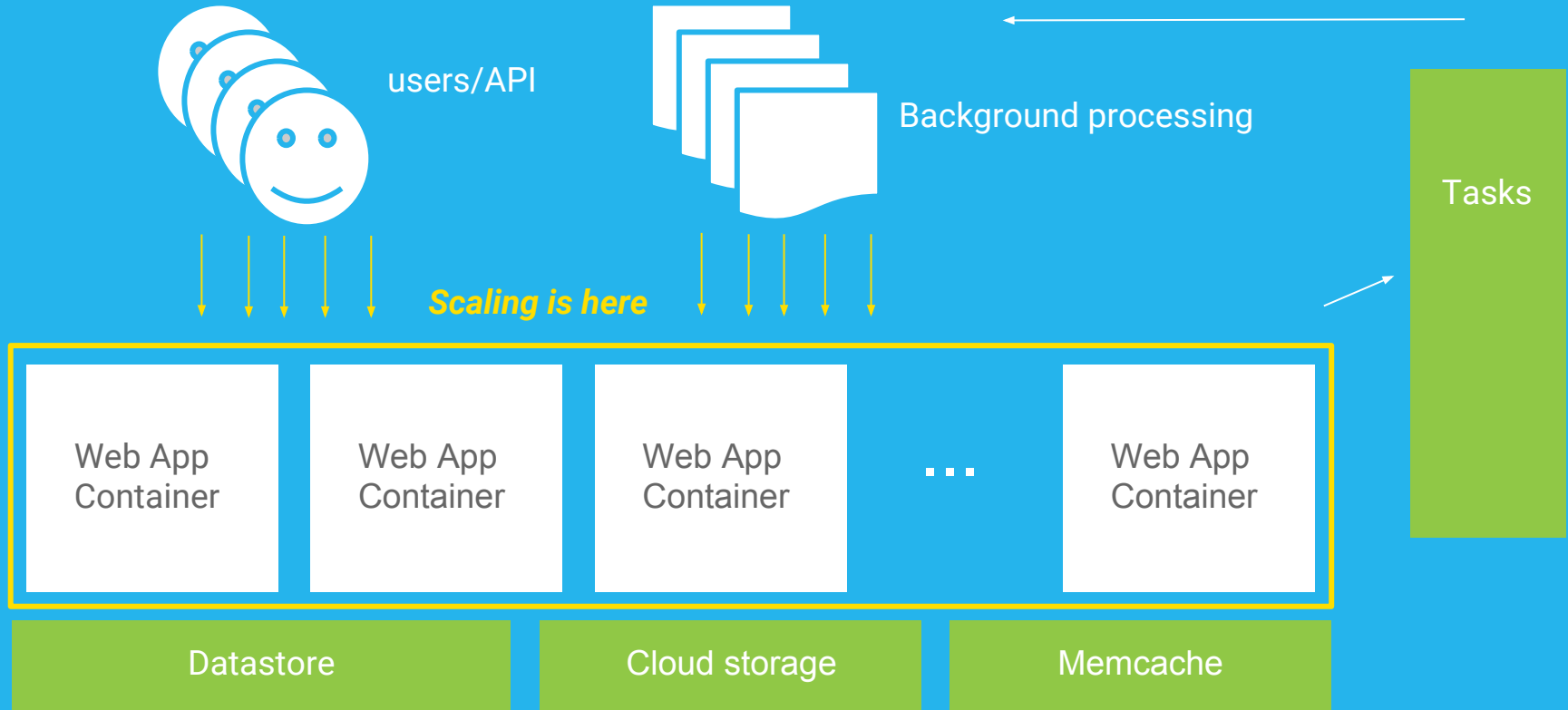| Web App Container | Web App Container | Web App Container | ... | Web App Container |

| Datastore | Cloud storage | Memcache |

What's cool about App Engine

General Platform

- Java, Go, PHP, Python
- *+ other containers*
- Any GETs or POSTs
- *i.e APIs, web apps, services*
- Scales for you
- High throughput services: Datastore, Task Queues

Developer Friendly

- Fast prototyping
- Local dev environment
- Versions, deployment
- traffic splitting
- Unit testing tools
- Environment monitoring, logging, dashboard, billing

Engineering: Fast Prototyping
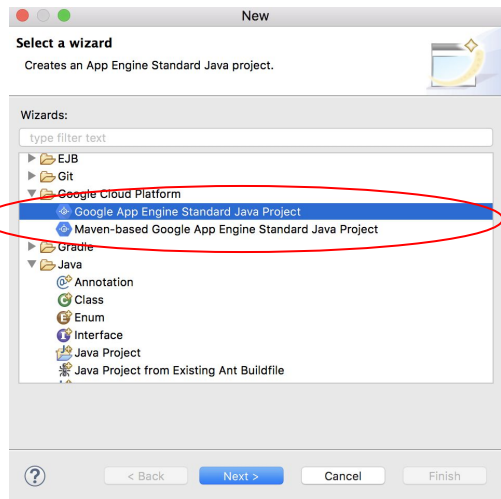
...write some code...

Engineering: versions, deployment

Engineering: environments
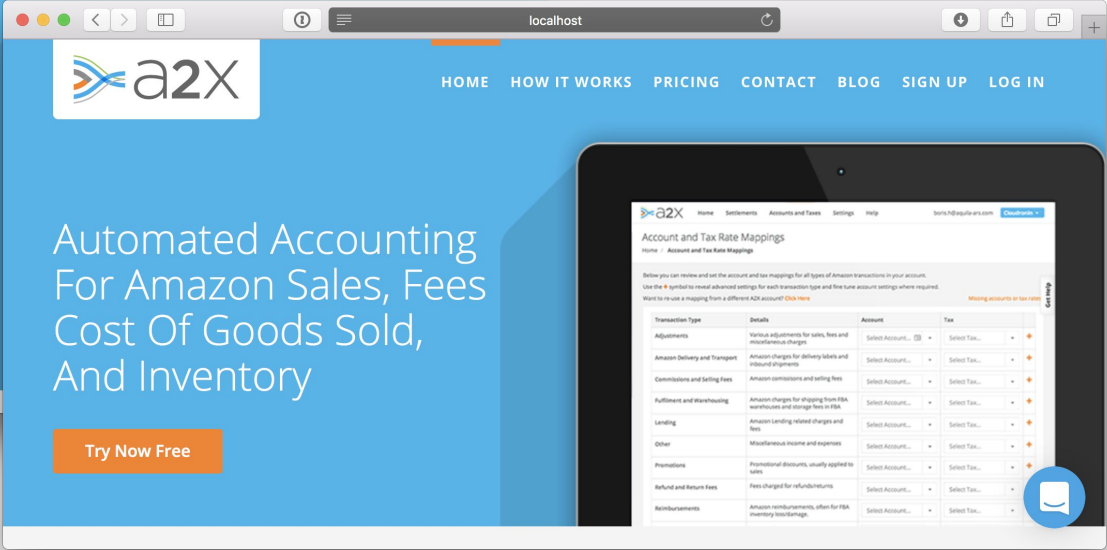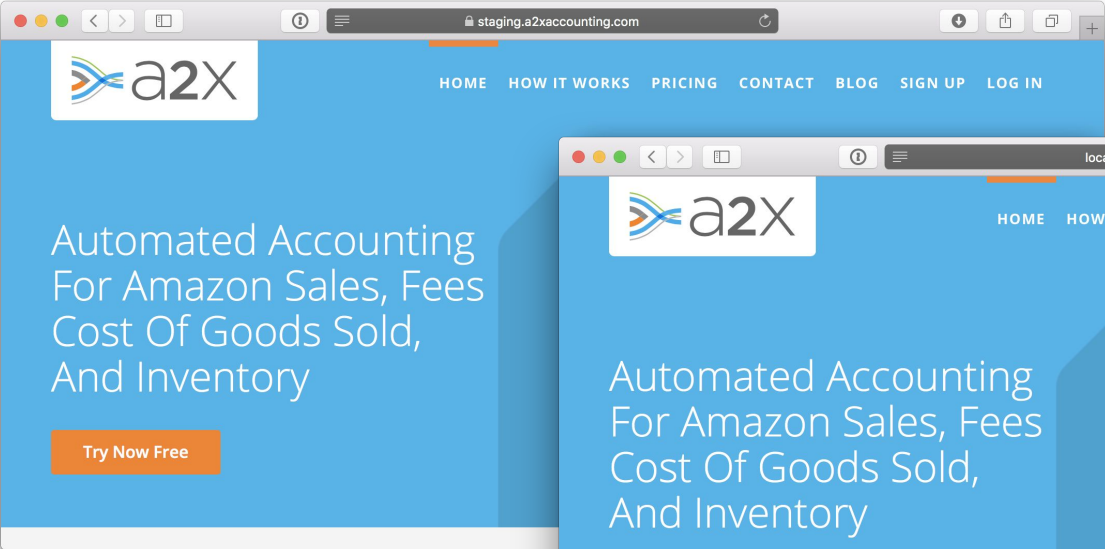
Engineering: Easy Profiling
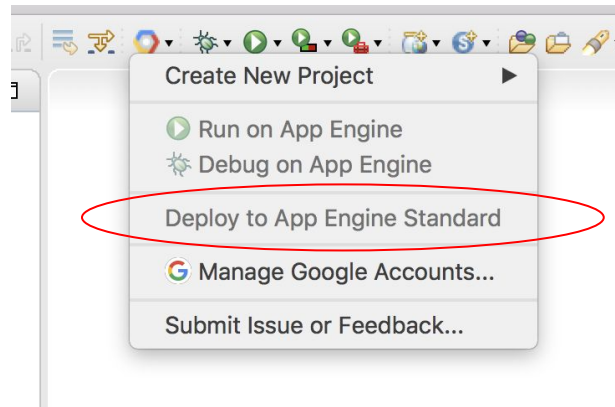
Monitoring: health

Instances

Total instances   Jul 26, 2017 7:47 PM

15.0

7.5

0

Wed 19   Thu 20   Fri 21   Sat 22   Jul 23   Mon 24   Tue 25   Wed 26   Thu 27   Fri 28   Sat 29   Jul 30   Mon 31
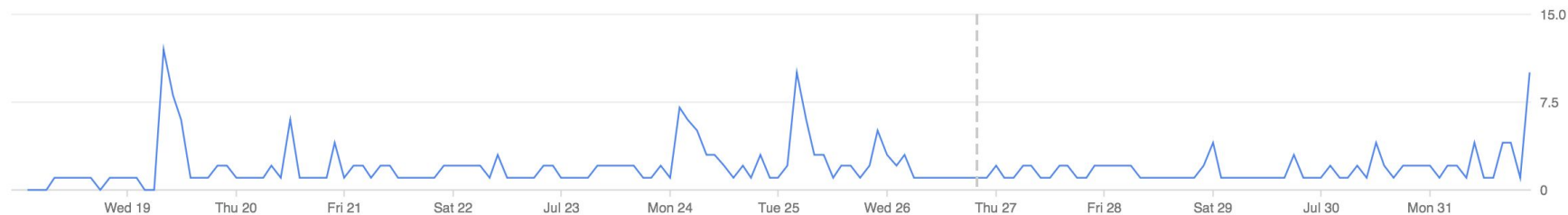
● Created: 10.00

Push Queues   Pull Queues   Cron Jobs

Queue Name	Tasks In Queue	Completed In Last Min.	Oldest Task ETA ⑦
default	726	13	2017-07-31 (22:12:05) (2 sec ago)

Application Errors ⑦

Occurrences	Count	Error
	414	**MarketplaceWebServiceException: The seller does not have an eligible Amazon account to call Amazo** com.amazonaws.mws.MarketplaceWebServiceClient.invoke (MarketplaceWebServiceClient.java)
	144	**MarketplaceWebServiceException: Request is throttled** com.amazonaws.mws.MarketplaceWebServiceClient.invoke (MarketplaceWebServiceClient.java)

Monitoring: budgets & costs

Billing status

Enabled (Daily spending limit: $200.00) Settings
Quotas reset every 24 hours. Next reset: 24 hrs ?

Resource	Usage	Billable
Frontend Instance Hours	3.51 Instance Hours	0.00
Logs Stored Data	1.00 GB	0.00

← Create budget

Set budget

Your budget can be a specified amount or based on previous spend. Budget spend resets the first day of each month to $0.00.

Budget name

Example Budget

Project or billing account
Select a project or billing account for your budget to track

A2X Accounting ▾

Budget amount
Set a budget by entering a specified amount or by selecting last month's spend

Specified amount ▾ $ 1000

☐ Include credit as a budget expense ?

Set budget alerts

Send email alerts to billing admins after spend exceeds a percent of the budget or a specified amount. Alerts are based on estimated expenses, so actual expenses may be greater.

Percent of budget	Amount	
50 %	$ 500.00	✕
90 %	$ 900.00	✕
100 %	$ 1000.00	✕

+ Add item

Save   Cancel

The 'catch'?

- No state on the app server

- Request time/resource limits

- No threads (*well, limited threads*)

- Sandbox with whitelisted libraries - no low level APIs

- No filesystem (use cloud storage)

And... Selling your soul to Google

```
7   import com.amazontoxero.shared.DateUtils;
8   import com.google.appengine.api.datastore.Key;
9   import com.google.appengine.api.datastore.KeyFactory;
10  import com.google.appengine.api.datastore.ShortBlob;
11  import com.google.appengine.api.datastore.Text;
12  import com.google.appengine.api.taskqueue.DeferredTask;
13  import com.google.appengine.api.taskqueue.Queue;
14  import com.google.appengine.api.taskqueue.QueueFactory;
15  import com.google.appengine.api.taskqueue.TaskOptions;
16
17  import java.io.Serializable;
18  import java.util.ArrayList;
19  import java.util.Date;
20  import java.util.HashMap;
21  import java.util.List;
```

What's next for App Engine?

- Google has made a long term commitment to App Engine

- Java 8 is in beta on App Engine

- BigQuery to analyze 100's of GB of raw source

App Engine; fast start, easy scale up

- + A fast easy way to get started

- + A smooth transition to growth, no need to re-architect

- + Clear path to scale up further within the same platform

- - Limits on what you can do on the platform

- - Tight lock-in to Google's infrastructure

Thank You!

Questions, comments?
(ps: we're hiring)

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