



Building & Managing Your Application

Google App Engine



Google Cloud Platform

Agenda

1

How Do You Troubleshoot?

2

Understanding the Quotas

3

Managing App Deployment with Versions

4

Lab Exercise

What If Something Stops Working?

Legacy app:

- Log into servers
- Review OS, apps, and logs

App Engine app:

- Runs in the cloud
- Could run in any data center

General Troubleshooting Hints:

- Check App Engine status using System Status Page and mailing list.
- Check Admin Console - instances, versions, traffic, and quota dashboard, etc.
- Look into the aggregated logs for every request in near real time

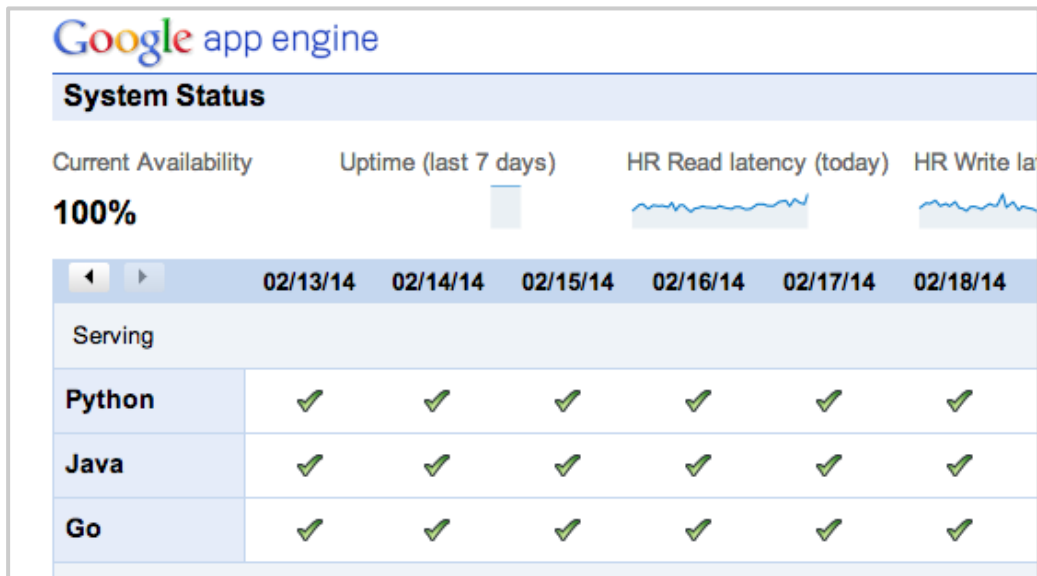
Monitor App Engine Status

Check App Engine Status:

- [System Status Page](#)

Receive Incident Notification:

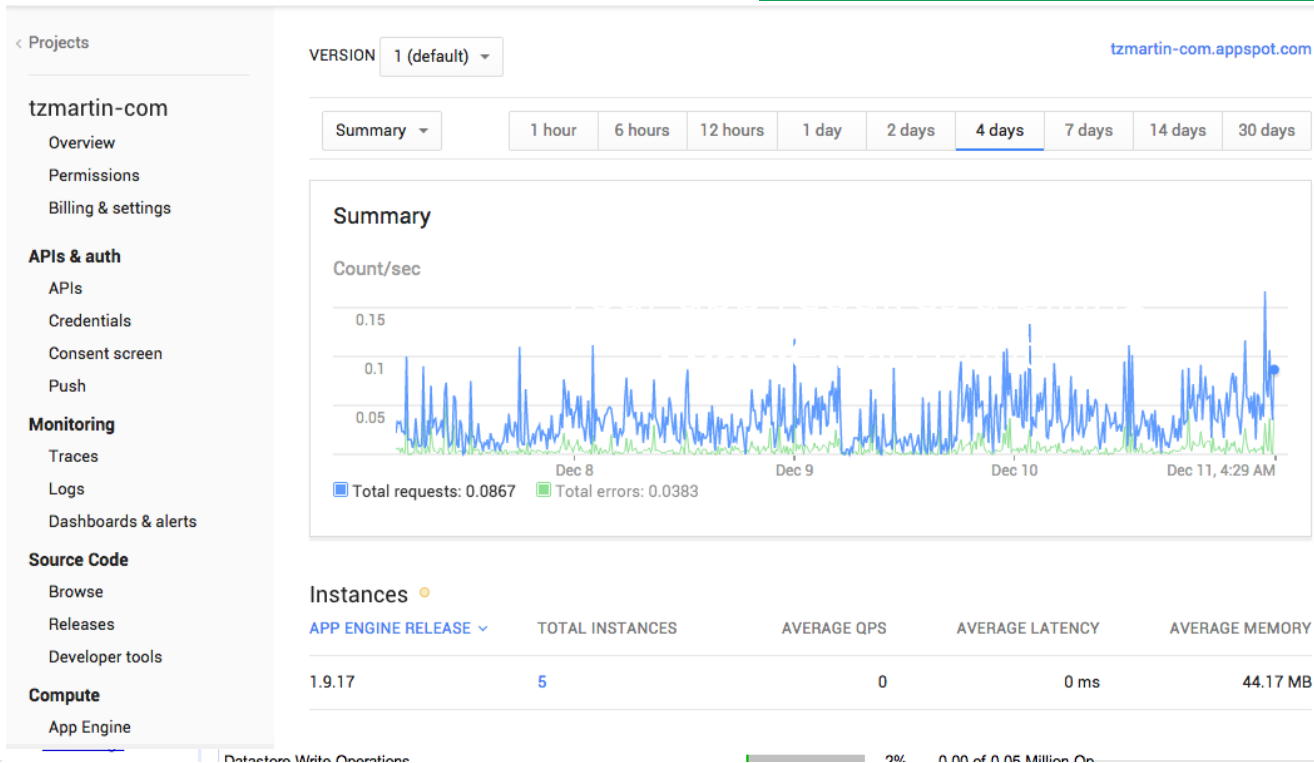
- [google-appengine-downtime-notify](#)



App Engine Admin Console

Google Developers Console

Use this: <https://console.developers.google.com>



Important Admin Console Pages

For daily monitoring, use:

- Dashboard (the first page)
- Instances Page
- Quota Page
- Logs Page

For app configuration and deployment, use:

- Application Settings Page
- Versions Page

Admin Console Page - Logs

Request Log vs. Application Log

```
2014-02-20 10:10:30.859 /listconferences
200 264ms 2kb Mozilla/5.0 (Macintosh; Intel Mac OS X 10_9_1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/32.0.
2620:0:1000:3803:a800:1ff:fe00:54b5 - - [20/Feb/2014:10:10:30 -0800] "GET /listconferences
- "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_9_1) AppleWebKit/537.36 (KHTML, like Gecko)
Safari/537.36" ms=264 cpu_ms=259 cpm_usd=0.000311 app_engine_release=1.8.9
instance=00c61b117c333c0487ef837e8a1a6c56b1754c
```

Log Management

- Store max 1 GB of logs for 90 days (free)
- Save logs for 365 days (at \$0.026 / GB / month)
- Logging in production vs in staging environment
- Use API to pull logs out of App Engine into GCS and BigQuery

If you expect lots of logs, make sure to enable billing

What is the most common issues that causes application failure in App Engine?

Quota Error



Google App Engine

Understand the Quotas

What Is Quota?

Quota is a limit on resource usage to protect the App Engine system

Resources with Quotas

- Incoming/Outgoing Bandwidth
- Datastore usage
- Mail
- Others
 - Code/Static Data/Logs
 - Channel/XMPP
 - Task Queue
 - URL Fetch
- Quota dashboard in Admin Console

App will get *Quota Errors* if exceeded

Types of Quotas

Daily Quota

- Daily Limit
- Refreshed @ midnight Pacific Time (PST)

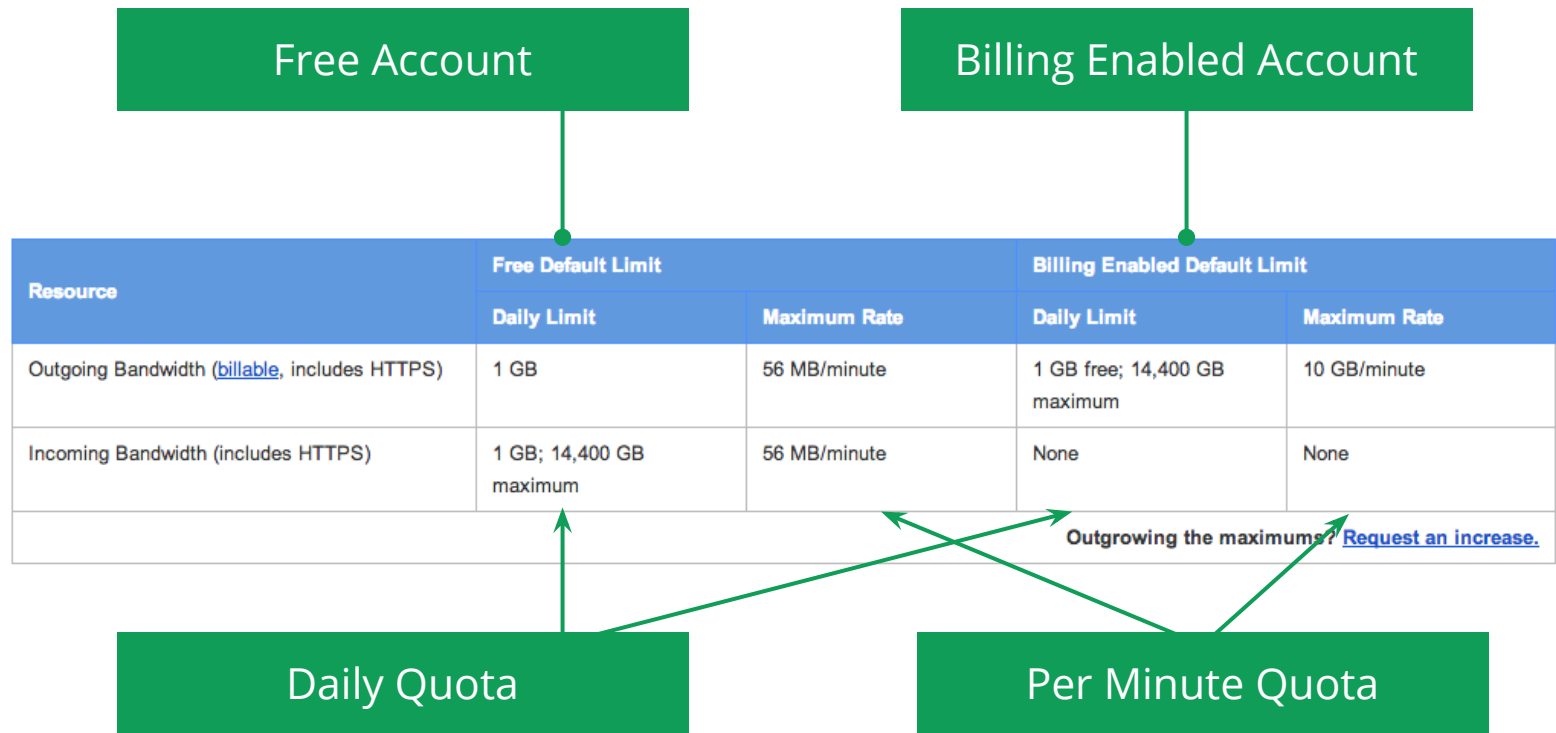
Per-minute Quotas

- Maximum Rate
- Refreshed every minute

Notes

- Different limits for free accounts and billed accounts
- For billed account, most quota limits are soft limits

Example - Incoming/Outgoing Bandwidth Quotas



Admin Console Page - Quota Details

Main

[Dashboard](#)[Instances](#)[Logs](#)[Versions](#)[Backends](#)[Cron Jobs](#)[Task Queues](#)[Quota Details](#)

Data

[Datastore Indexes](#)[Datastore Viewer](#)[Datastore Statistics](#)[Blob Viewer](#)[Prospective Search](#)[Text Search](#)[Datastore Admin](#)[Memcache Viewer](#)

Administration

[Application Settings](#)[Permissions](#)

The quota details for this application are grouped by API and are listed below. If your application exceeds 50% of any particular quota halfway through the day, it may exceed the quota before the day is over. To learn more about how quotas work, read [Understanding Quotas](#) and [Why is My App Over Quota?](#)

Requests

Quotas are reset every 24 hours. Next reset: 9 hours

Resource	Daily Quota		Rate ?
Requests		482	Okay
Outgoing Bandwidth	<div><div></div></div>	1% 0.01 of 1.00 GBytes	Okay
Incoming Bandwidth	<div><div></div></div>	0% 0.00 of 1.00 GBytes	Okay
Secure Requests		0	Okay
Secure Outgoing Bandwidth		0.00 GBytes	Okay
Secure Incoming Bandwidth		0.00 GBytes	Okay
Frontend Instance Hours	<div><div></div></div>	54% 15.25 of 28.00 Instance Hours	Okay
Backend Instance Hours	<div><div></div></div>	0% 0.00 of 9.00 Instance Hours	Okay

Storage

Datastore Write Operations	<div><div></div></div>	2% 0.00 of 0.05 Million Ops	Okay
Datastore Read Operations	<div><div></div></div>	2% 0.00 of 0.05 Million Ops	Okay
Datastore Small Operations	<div><div></div></div>	0% 0.00 of 0.05 Million Ops	Okay
Datastore API Calls		714	Okay
Datastore Queries		528	Okay
Blobstore API Calls		0	Okay
Datastore Stored Data	<div><div></div></div>	23% 0.23 of 1.00 GBytes	Okay
Blobstore Stored Data	<div><div></div></div>	0% 0.00 of 5.00 GBytes	Okay
Data Sent to Datastore API		0.00 GBytes	Okay

How Do You Handle Quota Errors?

Quota Error

- Java: OverQuotaException
- Python: OverQuotaError
- For bandwidth and instance hour quota: HTTP 403 Forbidden
 - Code is never executed in these cases

To avoid *Quota Errors* your app could catch and handle Errors/Exceptions gracefully - Cost vs. Benefits?

Operation Cost Estimation

Estimation of operational cost based on resource usage

- Based on Billable Resource Unit Costs
- Limited by Max Daily Budget settings

Resource	Unit	Unit Cost
Outgoing Bandwidth	Gigabytes	\$0.12
Frontend Instances (F1) <i>default</i>	Instance Hours	\$0.05
Frontend Instances (F2)	Instance Hours	\$0.10
Frontend Instances (F4)	Instance Hours	\$0.20
Frontend Instances (F4_1G)	Instance Hours	\$0.30

Setup Budget

Set max daily budget

- Protects you against unexpected costs (think accidental endless loops!)

APPLICATION SETTINGS CUSTOM DOMAINS

DAILY BUDGET
Your budget today is \$35.00. Effective tomorrow, your budget will be \$5.00.

USD 5

GOOGLE LOGIN COOKIE EXPIRATION

Default (1 day) ▼

Save



Google App Engine

Manage Application Versions

Manage App Versions





- Set version in:
 - Java: WEB-INF/appengine-web.xml
 - Python: app.yaml
 - Can use any valid text for version
- Deploy a version
 - Staging vs. production
 - Can split traffic cross versions
- Default version
 - Time to switch to new default version
 - Min/Max idle instances for default version
 - Datastore applies to all versions
 - Memcache applies to all versions
 - Task Queue applies to all versions

Version		Default
<input checked="" type="radio"/>	1  instances java api_version: 1.0	Yes
<input type="radio"/>	2  instances java api_version: 1.0	No
<button>Make Default</button>		

Running Traffic Splits		
Version	Traffic %	Delete
2	<input type="text" value="5"/>	<button>Delete</button>
<button>Add Traffic Split...</button>		
Split traffic by: <input checked="" type="radio"/> IP Address <input type="radio"/> Cookie		

How to Refer to A Version

- Click version link in Admin Console
- URL for A Version
 - Default Version
http://app_id.appspot.com
 - Specific Version:
http://version.app_id.appspot.com

<u>Version</u>		
	<u>1</u> 	instances 23.45 MBytes java7
	<u>newversion</u> 	instances 23.45 mbytes java7

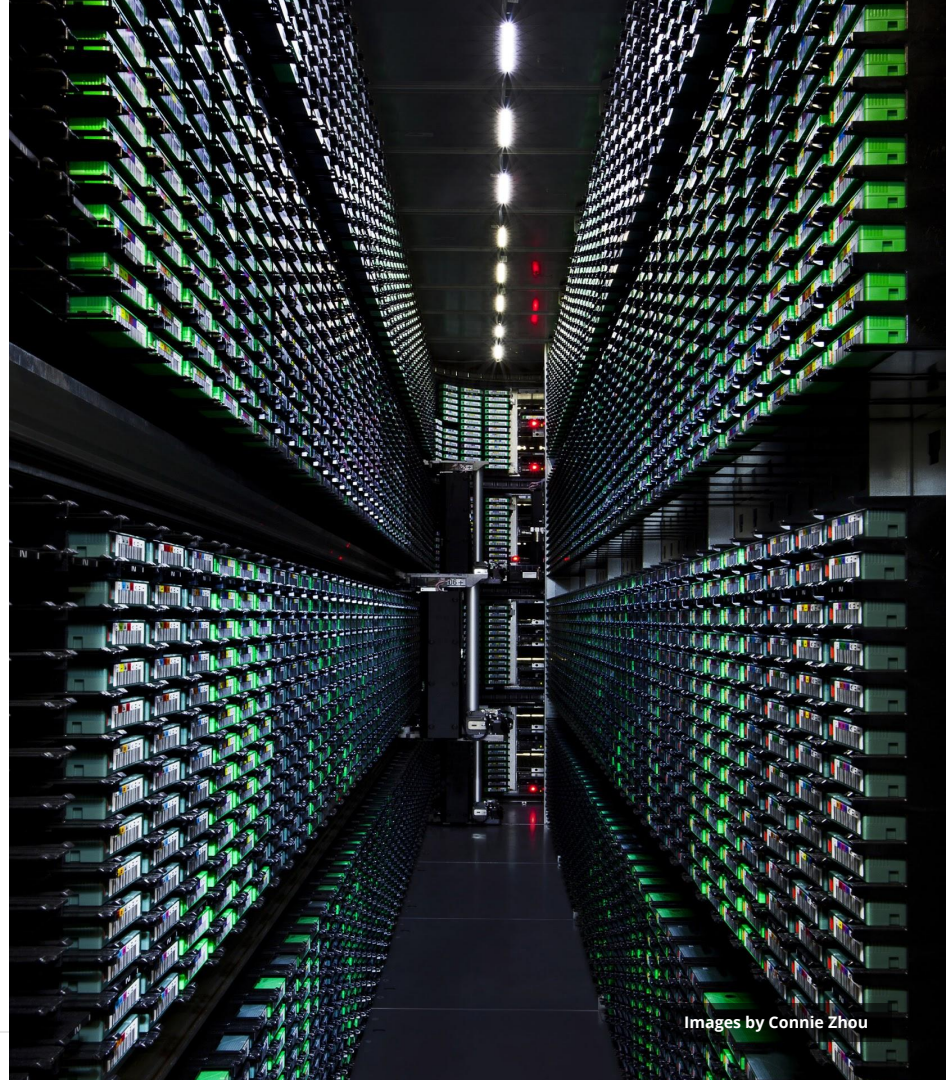
Quiz

What could you find out by inspecting the App Engine **System Status Page**?
(pick **one** answer)

- ☐ The health of your App Engine application
- ☐ Your remaining daily quota
- ☐ The health of the App Engine system
- ☐ Notifications about planned downtime
- ☐ How many instances your application is running
- ☐ Billing settings for your application

Codelab

- Learn about the tools available in the Admin Console for monitoring your App Engine application
- Download a zip containing the skeletal application, explore the layout, then deploy it and investigate it in the Admin Console



Images by Connie Zhou

Resources

Documents

- [App Engine Document: Admin Console](#)
- [Quotas](#)
- [Billing and Budgeting Resources](#)
- [SLA](#)
- [Premier Accounts](#)
- [Billing FAQ](#)

Articles

- [Managing Your App's Resource Usage](#)



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