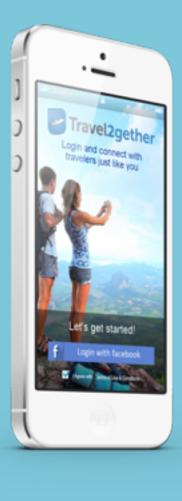


Scaling a Mobile Startup Thru The Cloud: A True Story Shai Almog & Chen Fishbein @Codename_One







Who Are We?



Shai Almog

Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions



Chen Fishbein

Co-founder & CEO of Codename One Founder of vprise consulting firm Sony Ericsson and more

Co-founder & CTO of Codename One from Sun Microsystems development environment

- Sun consultant working on mobile development tools since the 90's
- Member of original WTK team, co-creator of LWUIT project
- Worked with Sun/Oracle, IBM, DoCoMo, Nokia, Samsung, Verizon, Sprint, Vodafone,
- Open source hacker, Java developer since 96
- Over 20 years of professional software development experience
- Frequent conference speaker, JavaOne rockstar award winner, blogger & writer
- Co-founder of the open source LWUIT project, most successful open source mobile project
- Lead developer of the Sprint Wireless Toolkit, the most successful operator specific mobile
- Worked for Sun/Oracle, Samsung, Verizon, Sprint, Vodafone, Sony Ericsson and more Frequent conference speaker, JavaOne rockstar award winner, instructor & mentor



Cloud Architecture

Startup Building

What is this talk about?

PaaS vs. laaS



But First... What Is Codename One?

Some stories start at the end...



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AlignmentGrid.png	147 return Util.getImplementation().storageFileExists(name);
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Int.sourceforge.retroweaver.optimizer	166 L }
Inet.sourceforge.retroweaver.translator	168 0 /**
► 📓 Libraries	169 * Writes the given object to storage assuming it is an <u>externalizable</u> type
▼ Ø ₀ CodenameOneDesigner	170 * or one of the supported types 171 *
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► 📴 Libraries	173 * @param o object to store
SoloSPort	174 * @return true for success, false for <u>failue</u> */
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	179 try { 180 d = new DataOutputStream(createOutputStream(name));
Gource Packages Libraries	181 Util.writeObject(o, d);
v S JavaSE	182 d.close();
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Shooter	<pre>187 Util.getImplementation().cleanup(d); 188 return false;</pre>
- Carloner	189 }
	100





What Is Codename one

- WORA (Write Once Run Anywhere) For all mobile devices
- Debug locally on simulator
- Open source roots at Sun Microsystems circa 2006
- Basic service is free (with quota)

• Macs, Windows & Linux machines in cloud allow building native code with one click



Demo

What is Codename One and how does it work

Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions

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▶ 📷 Libraries	<pre>err.printStackTrace(); 186 Util.getImplementation().deleteStorageFile(name);</pre>
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► ∰ ₀ Shooter	188 return false;
	189 }





2006

2006

Chen creates LWUIT at Sun Microsystems to address device fragmentation issues

JavaOne 2008

LWUIT is open sourced and is picking up a community

Chen & Shai quit Oracle Join The Junction

March 12

Public beta Queue of developers waiting to join

2014

December 11

- accelerator
- 3 months to demo day

August 2014

50MM device installs 15K registered developers



JavaOne 200

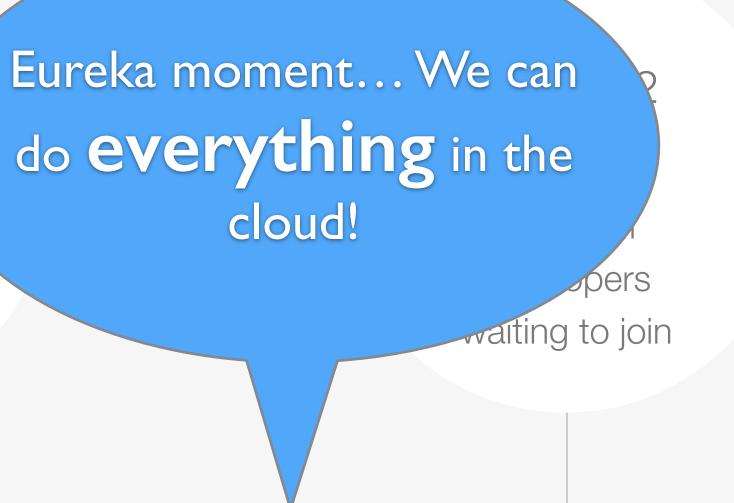
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Problem!

Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions



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Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions

Almost all of this is mobile experience. Didn't do serious server code since 2008!

osystems

Chen Fishbein

development environment

- Sun consultant working on mobile development tools since the 90's
- Member of original WTK team, co-creator of LWUIT project
- Worked with Sun/Oracle, IBM, DoCoMo, Nokia, Samsung, Verizon, Sprint, Vodafone,
 - hacker, Java developer since 96
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Our options for cloud:

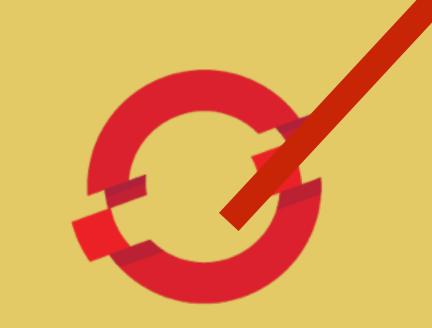
webservices™





heroku





OPENSHIFT



CLOUD SOLUTIONS









Our options for cloud:

Unavailable or beta late 2011

amazon webservices™





OPENSHIFT



as







Only one real choice in 2011...

We could have gone with AWS, avoided Java or host our own servers. All of the above would require more work than we could manage





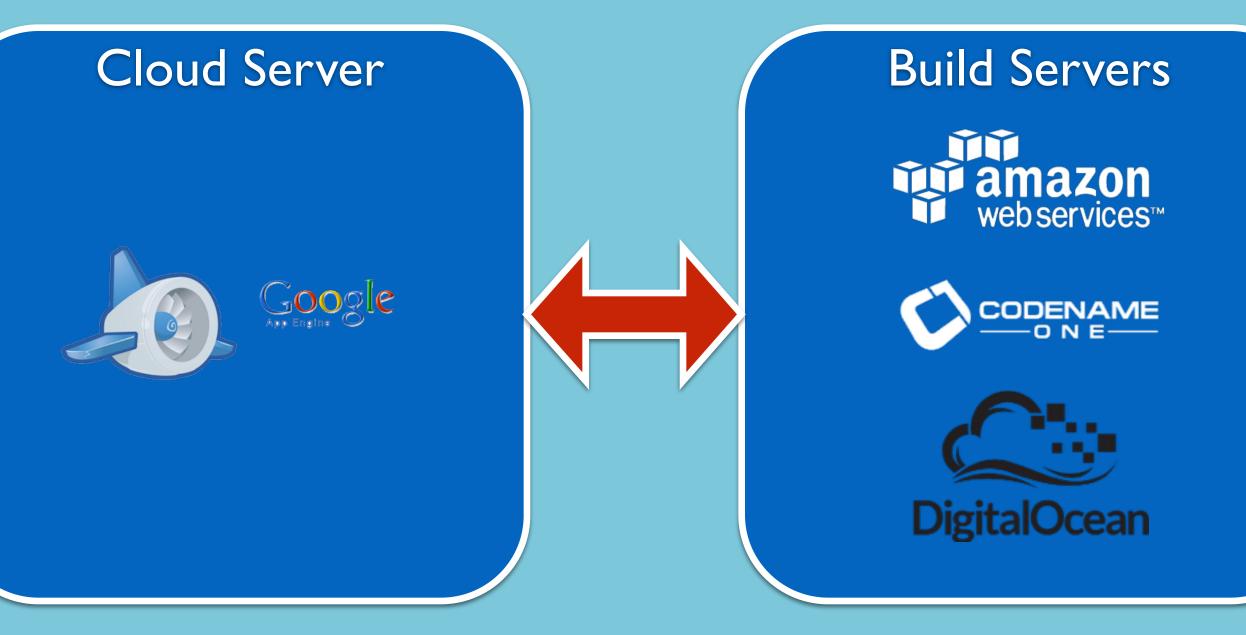


Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions



Developers









Introduction Codename One Startup Building Cloud Architecture PaaS vs. IaaS Questions

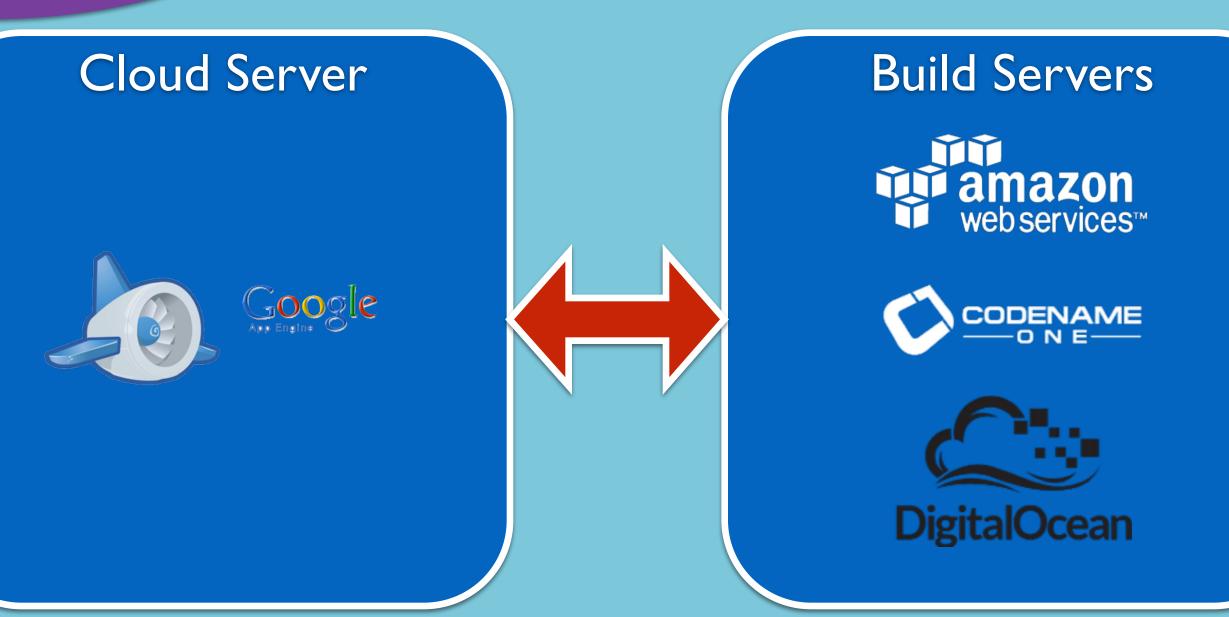
End User Devices



Optional device registration (one time), optional cloud storage communications

Developers

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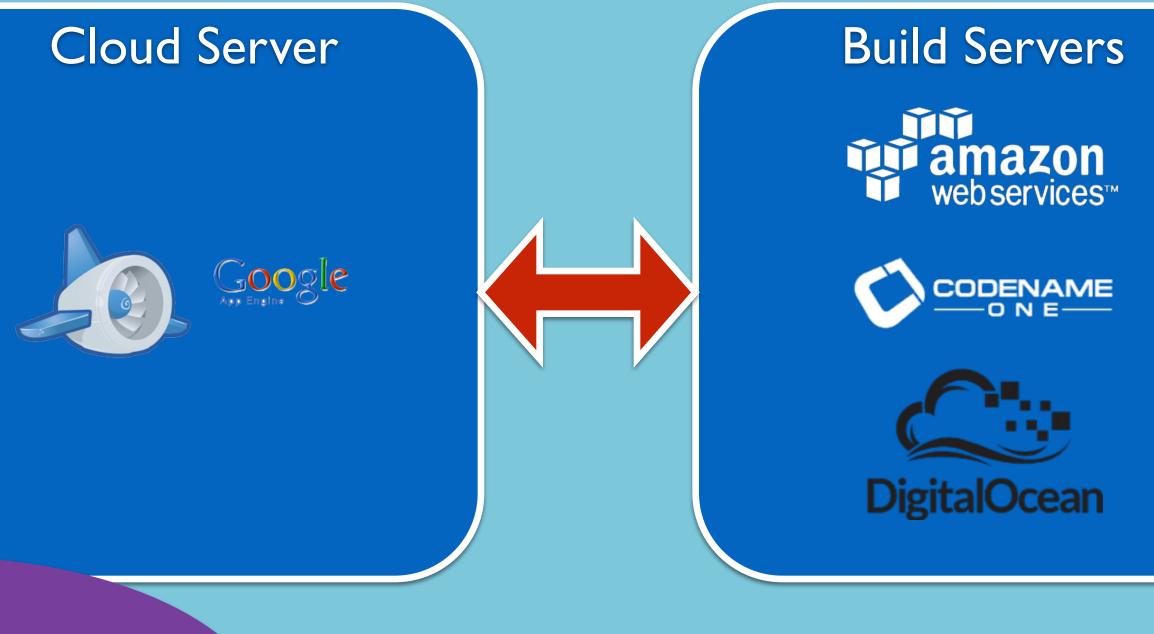
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Developers

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Developers never interact with the build servers directly









Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions



Developers



Cloud Server

Google



Build Servers

amazon webservices™





End users have no interaction that reaches the build servers. The computers themselves are hidden and firewalled



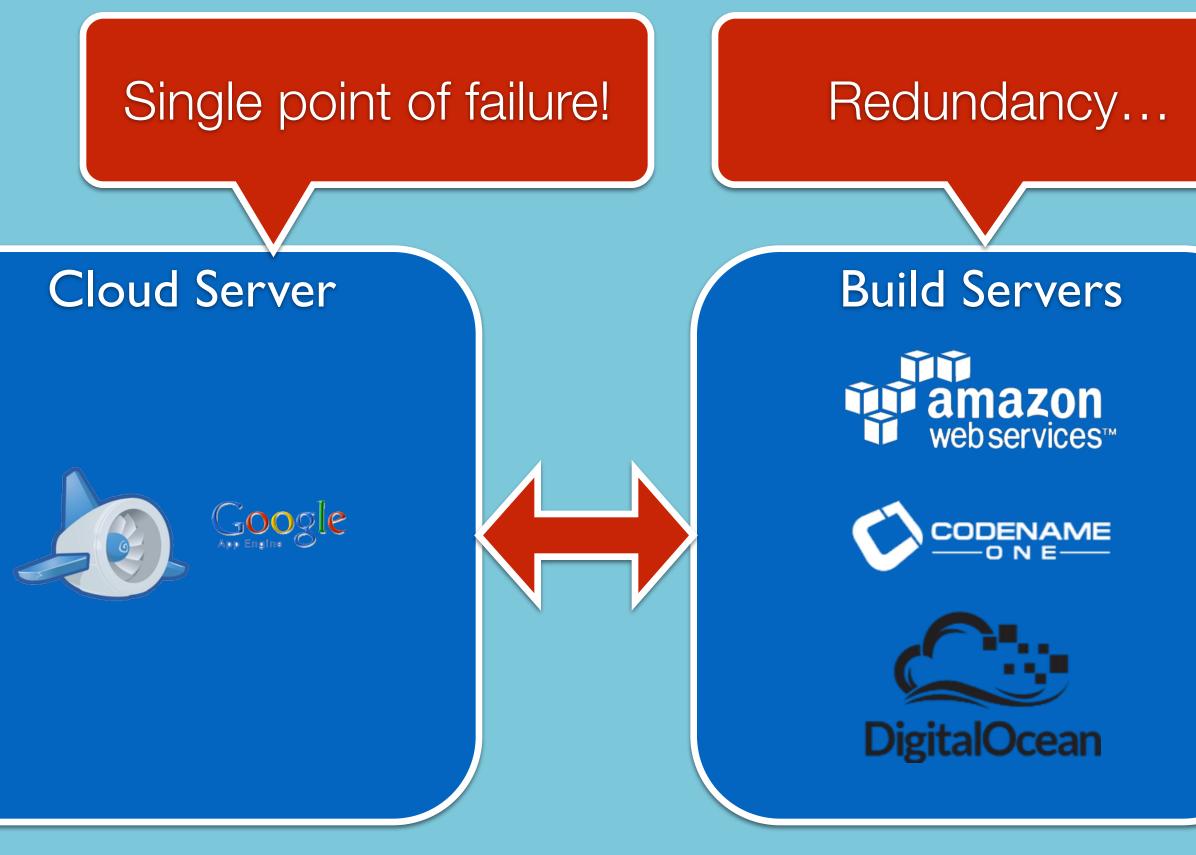


Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions



Developers









App Engine has its pros and cons

Without it we probably wouldn't have a startup so you can't get a better review than that but it had its pain points.

Most of these hold true to other PaaS environments to one degree or another.



Fast - network & performance

Pros

Cons

Java Cheap Reliable Seamless HTTPS No configuration Auto-scaling Scalable by default

Opaque Failures hard to track Production != Development Limited API's Can't do APNS, Image processing Datastore API is limited Spotty Support & Unclear Focus From Google



Storage - DataStore

- Using the DataStore API directly is relatively decent

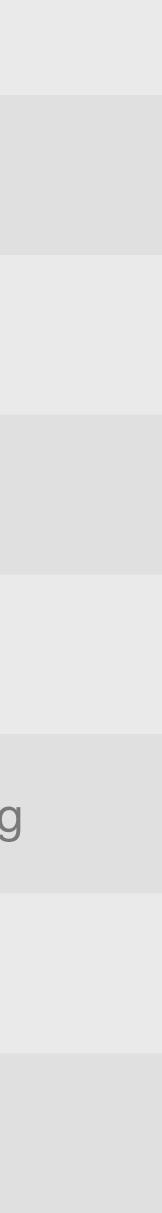
• When we started there was no cloud SQL option, so Big Table was the only option

• We didn't know enough and believed that we could use JPA for future cloud portability

The JPA implementation for App Engine is buggy and problematic

• Querying is difficult and extracting statistics requires map-reduce

• We were never able to get Google's map-reduce samples working in a real world setting

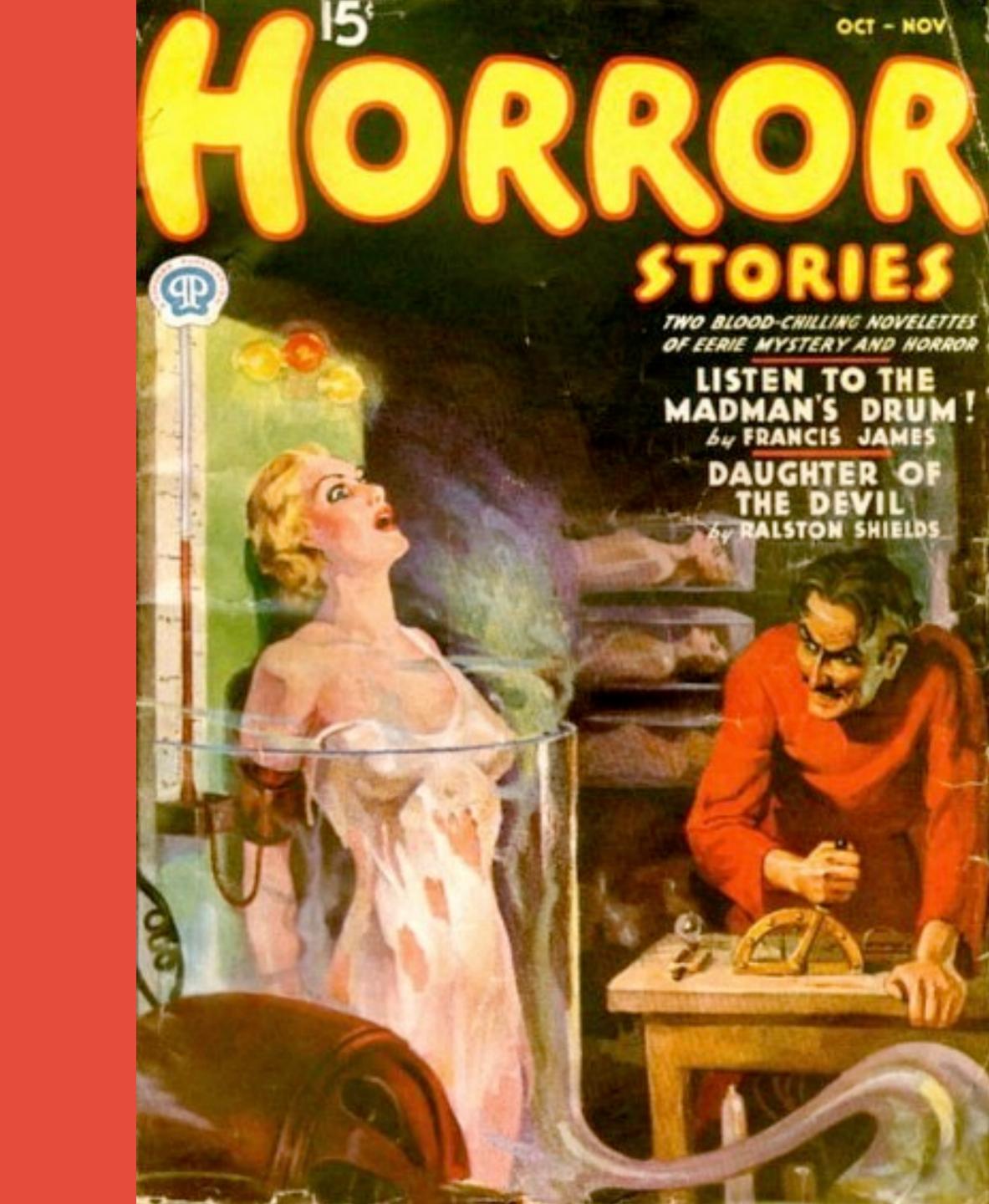




Introduction Codename One Startup Building Cloud Architecture

Failures

Cloud Archited PaaS vs. laaS Questions





Blobstore Stopped Working

- Uploads in Codename One go thru the blobstore API

• App Engine requests have a timeout limit which means you can't do file uploads

Blobstore suddenly stopped working without any error in the logs

• The API is opaque so app engine got the files (builds) but we didn't!

• Debugging consisted of guesswork since back then there was no paid support option!

• The API is opaque so app engine got the files (builds) but we didn't!

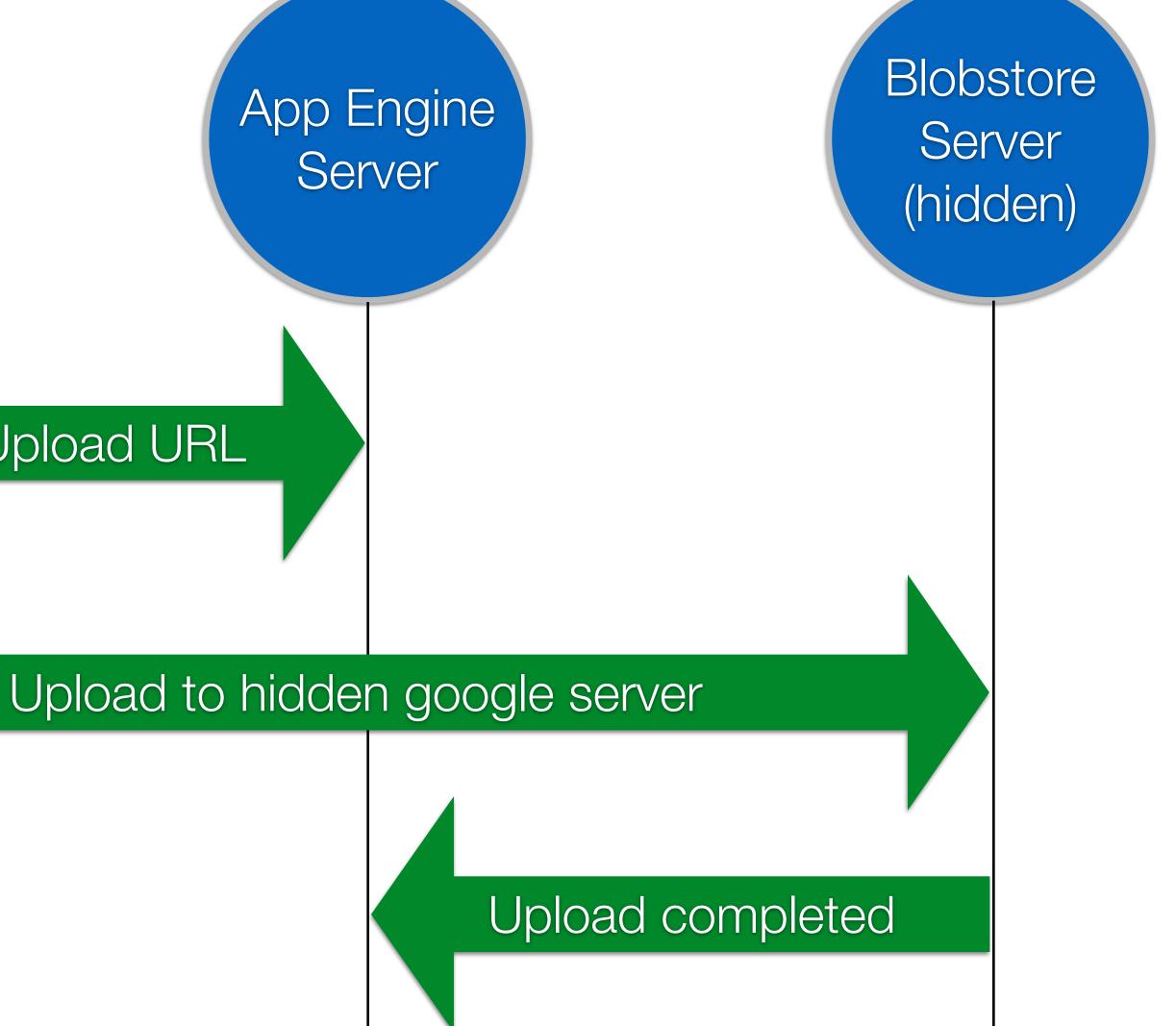


Blobstore Upload Request - How Does It Work?



Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions

Fetch Upload URL





Blobstore Upload Request - How Does It Work?

Client Build Library

Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions Fetch Up Fetch Up box, when it fails there is no way to debug it!

Upload to

App Engine Server Blobstore Server (hidden)

Upload completed

, server



Blobstore Upload Request - How Did We fix it?



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Fetch Upload URL

Uplo?

App Engine Server Blobstore Server (hidden)

Built a test case that worked but the fetched URL looked different... So we understood this was the problem



Blobstore Upload Request - How Did We fix it?



Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions

Fetch Upload URL

App Engine Server

Blobstore Server

If this servlet has an argument passed to it (that can be unused, e.g. authorisation data) the unrelated getURL API is broken!

Upload to hidden google ser

Upload completed





Blobstore Issues

- Our second worst downtime over 2 hours of total downtime

- Debugging these issues is guesswork more than debugger

Back then Google didn't have a paid support option which we now have

• Support is CRUCIAL with any PaaS provider, difficult on a startup budget



Everything Stopped Working Issue

- After a deployment to app engine everything stopped working!

- There was no indication and no way to fix it
- Worse downtime yet of over 3 hours!

Server logs showed odd exceptions that kept filling the logs and made no sense

Googling the issue showed some people reporting it but all had sync issues



What did we do?

- Updated Eclipse plugin and recreated the project
- Tried to create a blank project and see if it works
- This predated the paid support option

• Cleaned caches, restarted servers & posted in groups/stack overflow



Resolution

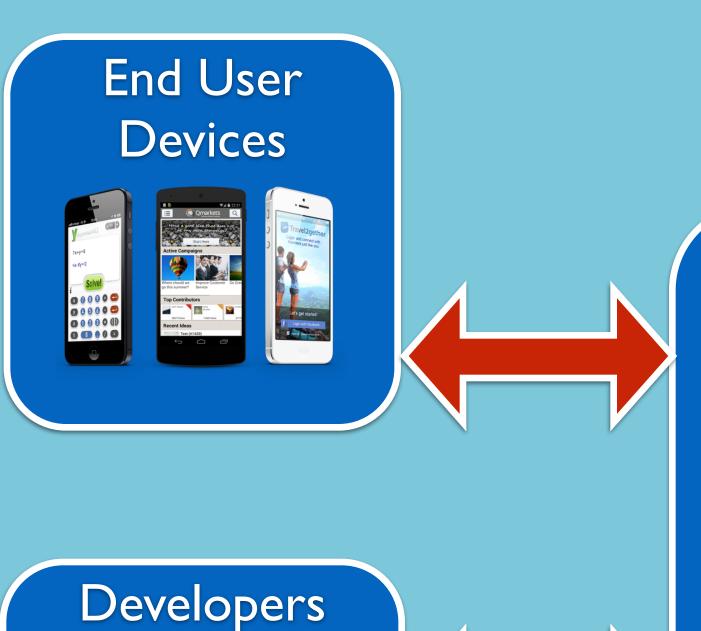
- An installation of Java 8 was picked up by Eclipse
- The only way to see/fix it was thru the ini file
- We found this out thru guesswork!
- Lessons: Always deploy to a new version

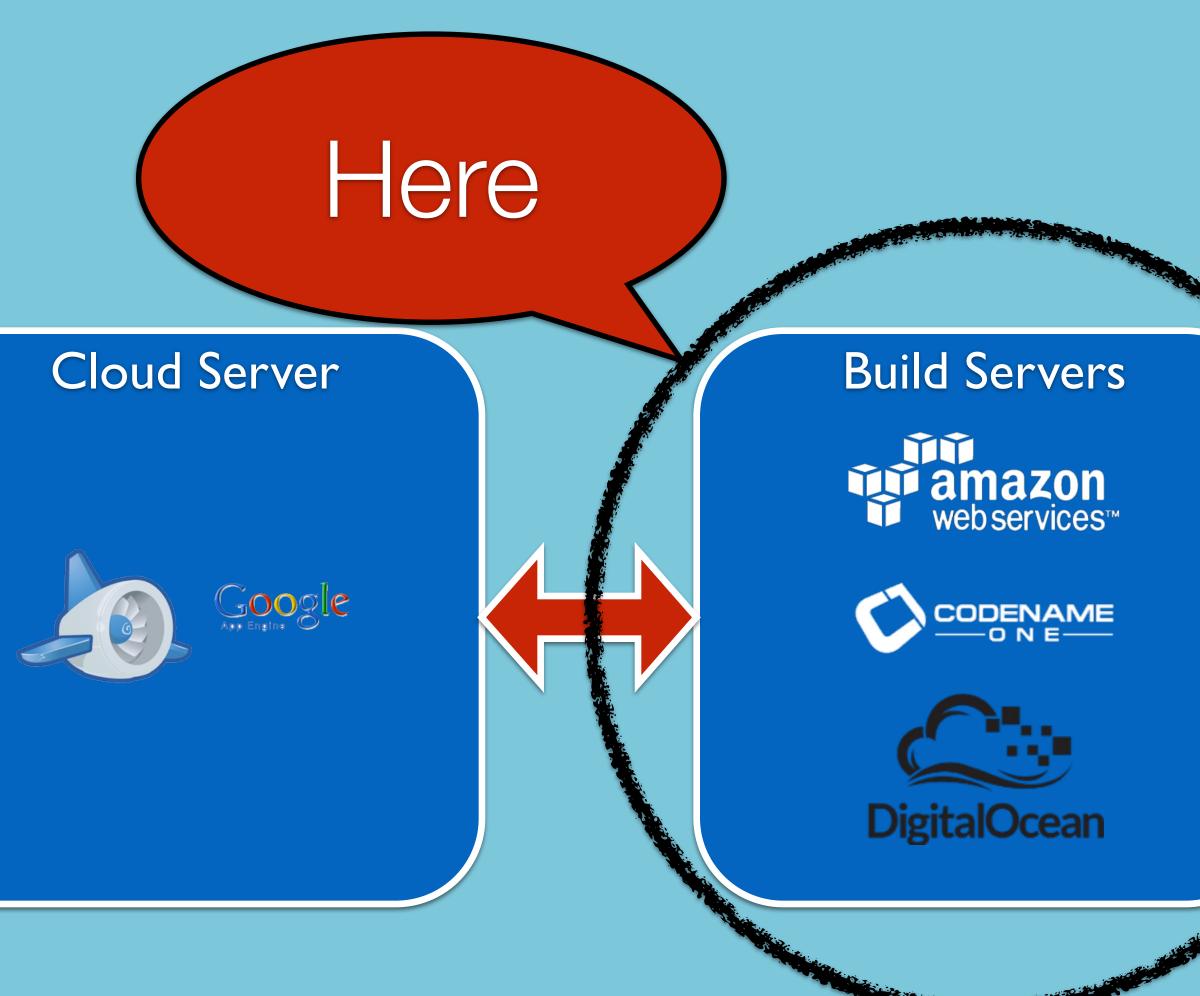
Googles plugin compiled with that VM rather than the JDK defined in preferences!



What about the laaS part?

Introduction Codename One Startup Building Cloud Architecture PaaS vs. laaS Questions









Introduction PaaS vs. laaS

laaS Is a Pain To Manage With Startup Resources

Without a dedicated virtualisation guy AWS overcharged us on servers

This was purely a result of our ignorance (reserved instances are confusing)

• Managing all these machine instances is a full time job and we just don't have the manpower

• Migrating from AWS to Digital Ocean just for simplicities sake (might also save a bit here)

Azure was an unstable nightmare and had remarkably obtuse billing as well

• Failures in the build servers aren't as traumatic (more localised, easier to detect and fix)







Lessons Learned

- PaaS can be very cheap and provide huge benefits

• Without PaaS our startup might not have gotten off the ground...

• We have 99.95% uptime, we are shooting for 4 9's in 2015 and its an achievable goal

Check that you actually need NoSQL options before getting started with it...

• Don't trust vendor promisses on Java EE compatibility at least in the storage dept.

Support is probably the most essential requirement for any PaaS solution



Thank You

Introduction Codename One

Further Reading

How Do I - http://codenameone.com/how-do-i.html Developer Guide - http://codenameone.com/developer-guide.html Course (free for pro users) - http://udemy.com/codenameone101/ Source code/lssue tracker - http://code.google.com/p/codenameone/ Blog - http://codenameone.com/blog

Shai Almog & Chen Fishbein @Codename_One http://www.codenameone.com/

- Discussion Forum http://www.codenameone.com/discussion-forum.html
- JavaDocs https://codenameone.googlecode.com/svn/trunk/CodenameOne/javadoc/index.html

