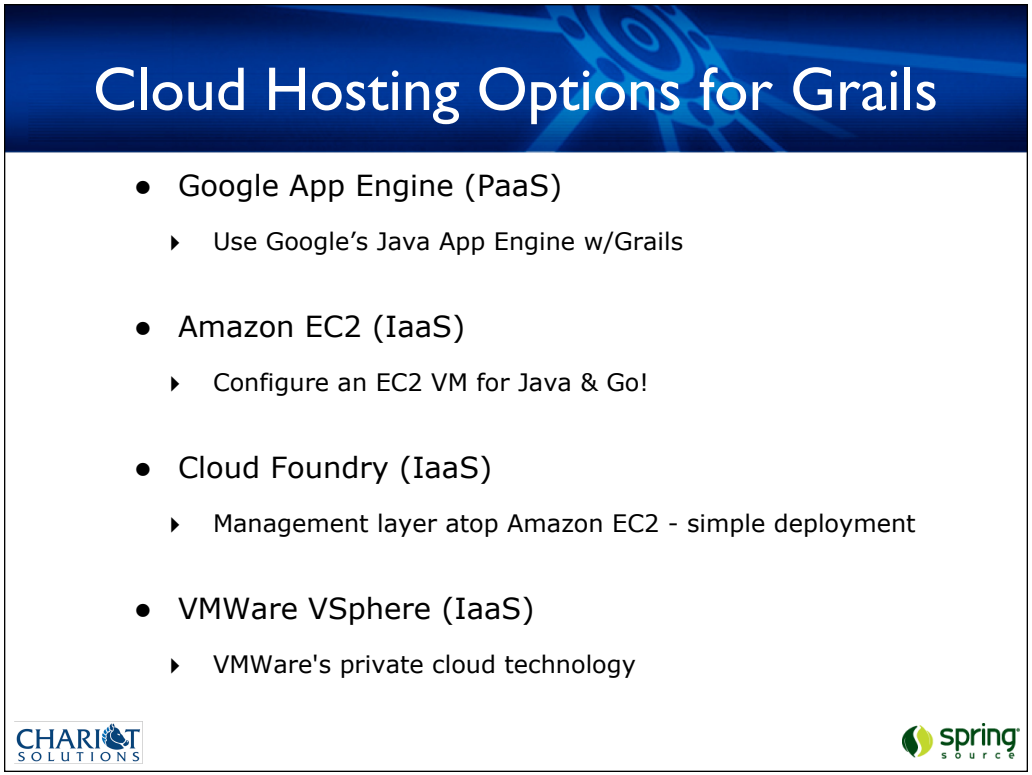
Grails in the Cloud

Google App Engine, EC2 and Cloud Foundry

Cloud Computing Service Categories

- Infrastructure as a service
  - On-demand virtual machines
- Platform as a Service
  - Write your application to a Cloud API
- Software as a Service
  - Renting software as an end-user (SalesForce, GMail)



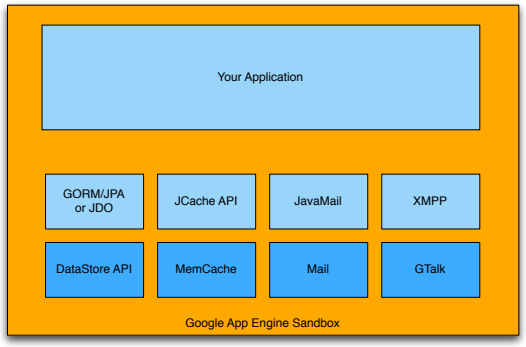
VMWare's vSphere will be a cloud computing platform

PaaS - Google App Engine

- A platform hosted on Google's network
- Language / Platform options
  - Python
  - Java
- The Java platform supports Java Web Applications
  - Google places constraints on Java APIs

Google's Sandbox Restrictions

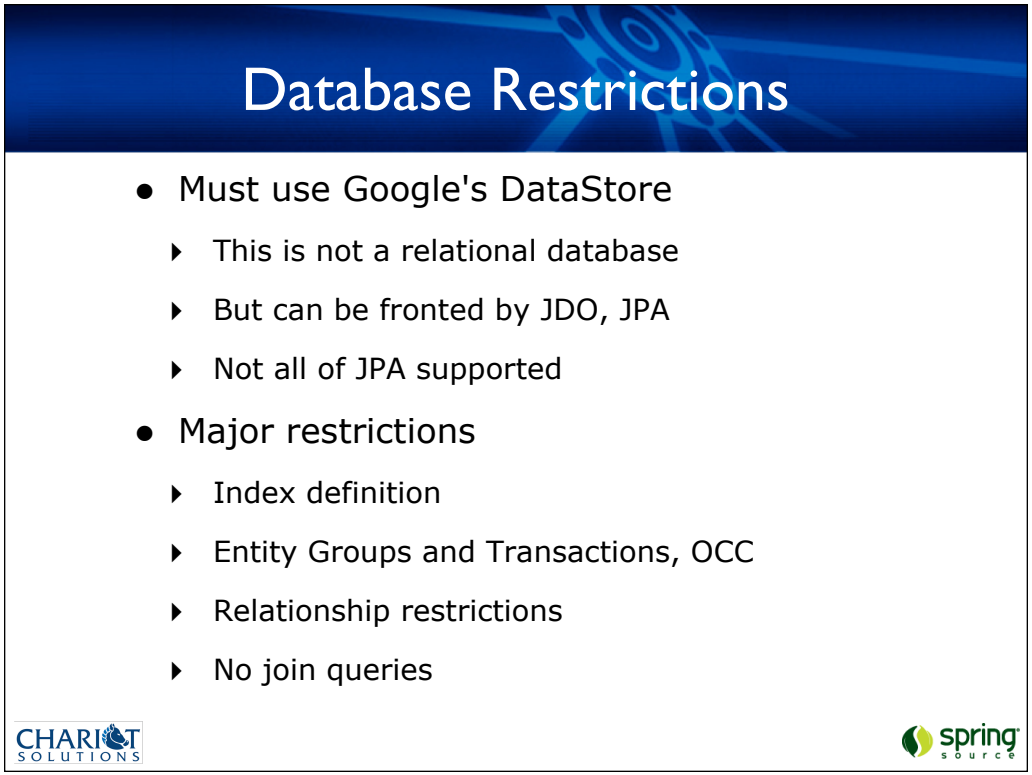
- Your application cannot directly
  - Write to the file system
  - Open a network socket
  - Spawn a thread or sub-process
  - Make system calls
  - Use a standard Relational Database
- JVM Calls are subject to a Whitelist
  - Any classes/methods outside of the whitelist will fail to execute
- Use of Google's Mail, cache, XMPP interfaces via APIs



- These restrictions force you into specific choices, and therefore platform lock-in
- You really have to design your app around AppEngine
- Not easy to migrate existing apps

CHARIOT SOLUTIONS

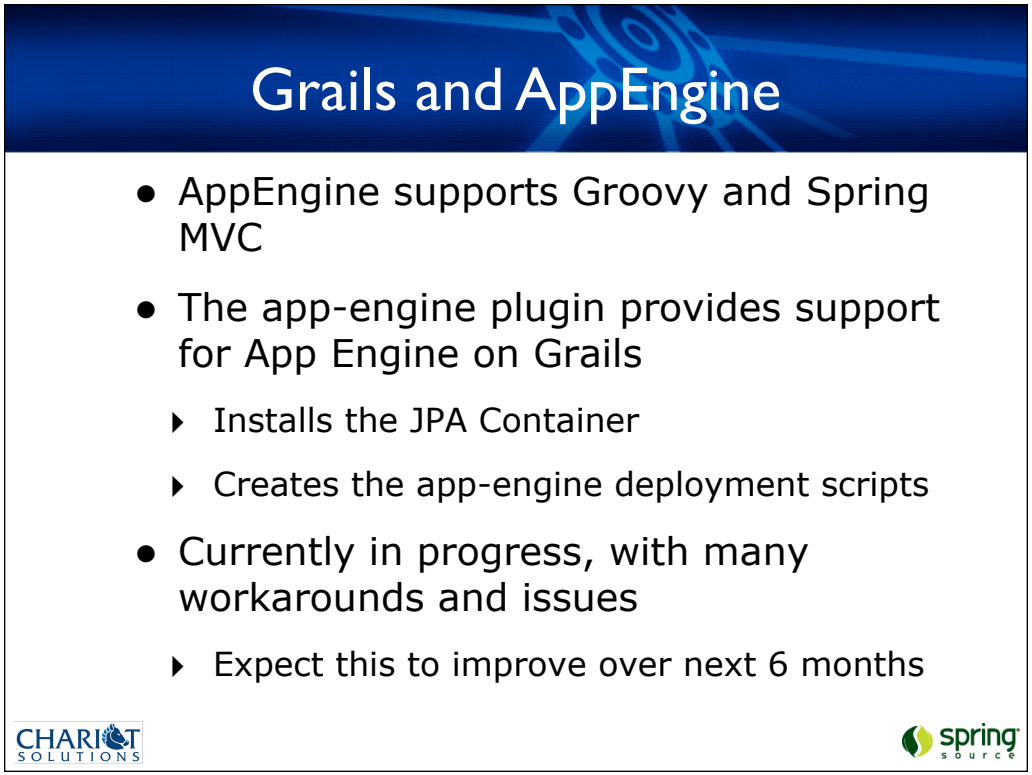
spring source



Google asks you to switch from a read (query) to a write (pre-calculate) mentality.
It is better to flatten out a relationship if you are going to call up related data on a regular basis.
Writing is much slower than reading.
Transactions cannot span entity groups...

Why Host in AppEngine?

- Zero-cost hosting until threshold
  - Thresholds are listed on the App Engine site
    - http://code.google.com/appengine/docs/quotas.html
    - Access to GMail, Image Service, domain accounts, XMPP, etc...
- Instant scalability
  - App Engine provides scalability on demand
  - You are using their underlying services (BigTable, etc)
  - Tradeoff: vendor lock-in

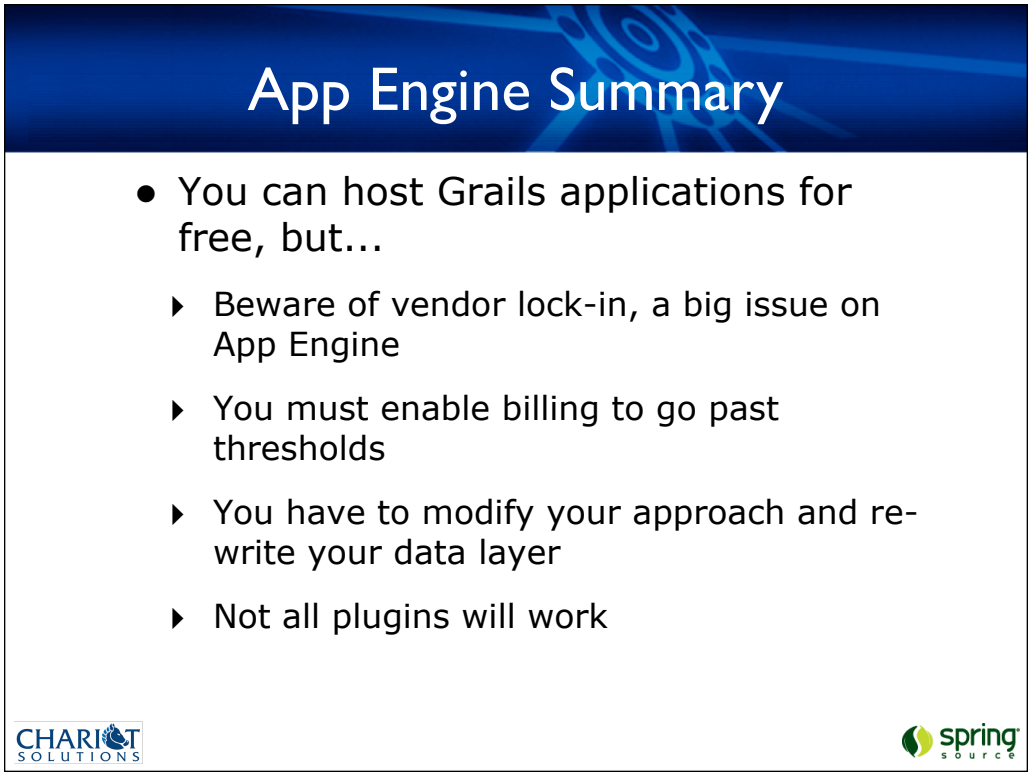


Current restrictions are strange
- only 12 applications per account
- cannot delete an application
- you can register for another account, but you must have a unique cell phone # for each account
- your application gets passivated if unused, so some write cron jobs to ping the application

JPA/JDO in Grails

- Must use JPA or JDO instead of Grails domains
  - Recommend JPA as most compatible with Grails
  - Place JPA classes in grails-app/domain
  - Note - you must create your domain classes in packages
- To use JPA with GORM API, install a plugin
  - grails install-plugin gorm-jpa

Demonstration - App Engine & Grails



- 1,000 file maximum in your deployment
- Most plugins won't work due to filesystem, network, thread restrictions
- JPA doesn't support owned One to Many

Groovy Alternative: Gaelyk

- Framework written by Gullaume Laforge & Marcel Overdijk
- Uses simple "Groovlets" and a direct abstraction of the DataStore API
- Much easier to write and deploy
- Closer to Python AppEngine code
- More information
  - http://gaelyk.appspot.com/

Infrastructure as a Service

Infrastructure Options

- Any platform that hosts Java EE will host Grails
  - Watch minimum RAM requirements
- Example: Amazon EC2
  - Easily scale from one to dozens of servers
  - Implement in any app server and database you'd like
  - Use EC2 directly or CloudFoundry
- Tradeoff : Price -vs- agility

Amazon Elastic Compute Cloud (EC2)

- A vast network of computers
- You create / use Amazon Machine Images (AMIs) to run Virtual Machines
- Many VMs exist with Java out of the box...
  - Java "Webapps in a Box" Apache Tomcat on Port 80, MySQL, Java 6
    - EC2 AMI: ami-aa5abac3
    - Reference: www.javawebappsinabox.com/tutorial.html

CHARIOT SOLUTIONS

spring source

This VM has Java 1.6, Apache Tomcat and MySQL all ready to go

Demo - Amazon EC2

But it gets easier!

- Use SpringSource Cloud Foundry
  - Built by Chris Richardson, EC2 consultant
  - Company Acquired by SpringSource
- Simple deploy to pre-built EC2 instances
  - Just supply schema & war
  - Choose your topology
  - CloudFoundry will deploy based on your settings

CloudFoundry Demo

In Summary...

- AppEngine is free (to a point), however you are locked in to a vendor solution
- EC2 is very flexible, infinitely configurable, but you need infrastructure expertise
- CloudFoundry (SpringSource tool) hides EC2 complexity and provides web-driven deployment to EC2

Thank you