What's New in Cloud Foundry

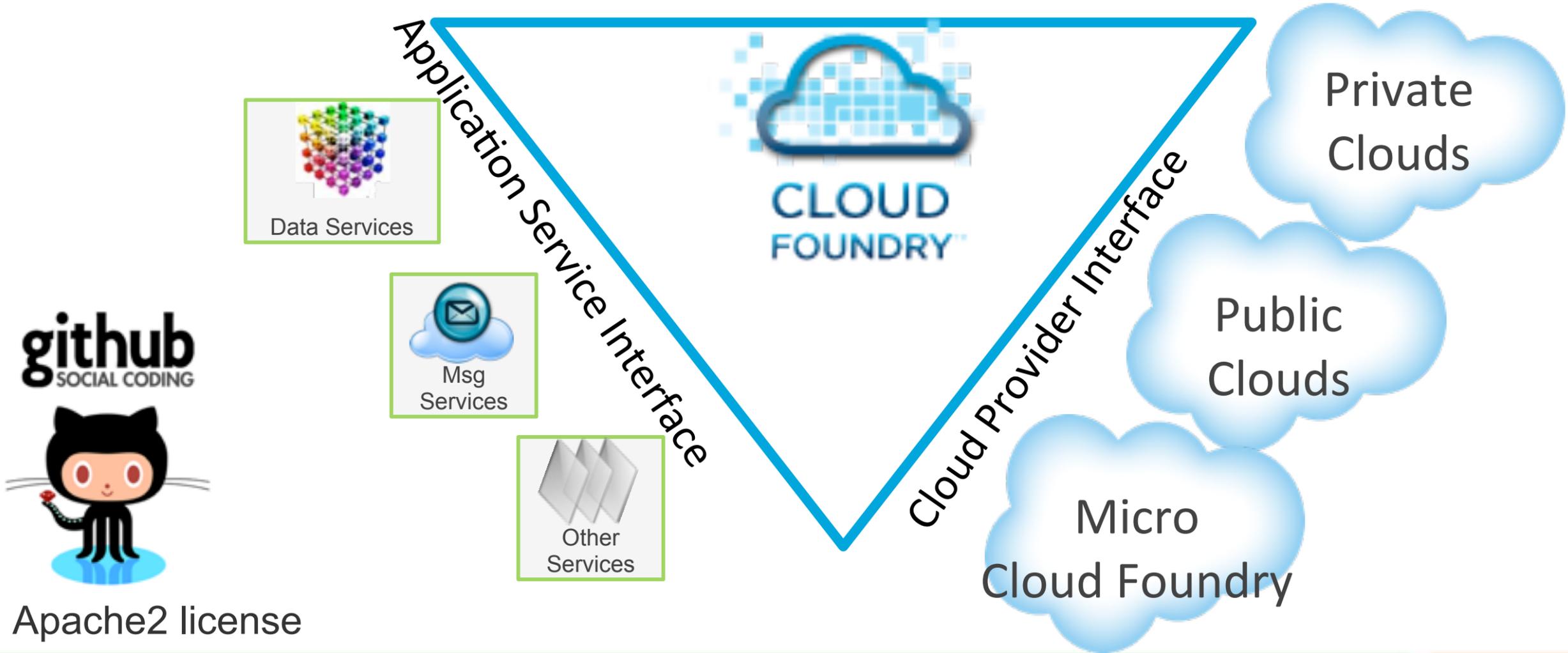Jennifer Hickey

About Jennifer

- Engineer @ Cloud Foundry
- Focused on framework support
- Long time SpringSource-er
- Contributed to many Spring and SpringSource projects
- Passionate about increasing developer productivity in the cloud.

Contact Info

Twitter: @jencompgeek
Email: jhickey@vmware.com

Sunday, December 9, 12

Cloud Foundry Open PaaS

Application Service Interface

Cloud Provider Interface

Data Services

Msg Services

Other Services

Private Clouds

Public Clouds

Micro Cloud Foundry

github SOCIAL CODING

Apache2 license

Cloud Foundry Turns One

- Open sourced BOSH
  - A tool chain for release engineering, deployment and lifecycle management
  - Used to deploy cloudfoundry.com
- New open source contribution process
- More partners

Sunday, December 9, 12

Since Last Year...

Themes

Sunday, December 9, 12

Sunday, December 9, 12

DIVERSITY

Sunday, December 9, 12

Sunday, December 9, 12

Sunday, December 9, 12

Sunday, December 9, 12

Agenda

- Frameworks and Runtimes
- Security and Account Management
- Services
- Tools
- Micro Cloud Foundry
- CloudFoundry.com Commercial

Sunday, December 9, 12

What's New

Frameworks
and Runtimes

Sunday, December 9, 12

Core Runtimes and Frameworks

- Java
  - Spring
  - Grails
  - Lift
  - Play
- Ruby
  - Rails
  - Sinatra
  - Rack
- Node.js

Sunday, December 9, 12

Community and partners contributions

- Python
  - Django
  - WSGI
- Erlang OTP/Rebar
- PHP
- Perl
- .NET

Sunday, December 9, 12

The Platinum Rule

Treat each framework
the way it wants to be treated!

Sunday, December 9, 12

Common Framework Support

- Command-line for application management
  - Create apps and services
  - Update bindings, memory etc.
  - Scale instances
- Access service and app info through environment variables
  - Service host, port, credentials
  - App ip and port
- A runtime library
  - Connect to services
  - Retrieve app info

Sunday, December 9, 12

Common Framework Support

- Auto-reconfiguration for typical apps
- Access to services through Caldecott
  - Creates tunnel for local clients
  - Mysql, Mongo, Redis CLIs, etc
- Manifest support

Sunday, December 9, 12

Standalone: The "no framework" framework

- Cloud Foundry now supports standalone applications!
- Choose a runtime and provide a start command

```
$ vmc push myapp
Detected a Standalone Application, is this correct? [Yn]:
1: java
2: node
3: ruby18
4: ruby19
Select Runtime [java]:
Start Command: java -jar myapp.jar
```

Sunday, December 9, 12

Uses of Standalone Applications

- Run worker processes
- Use frameworks with Embedded Jetty or Netty
  - Unfiltered
  - Spray
  - vert.x

Sunday, December 9, 12

Scala on Cloud Foundry

- Lift

What's New

- Play

- Bring your Own Container (Web Apps)

  – Scalatra

  – Blue Eyes

  – Unfiltered

  – Spray

- Standalone support

  – Akka

Sunday, December 9, 12

Play Framework

- Supports Play 2.0

- Push Play app to CloudFoundry.com

```
$ play dist
$ vmc push --path=dist/dist.zip
```

- Automatically applies evolutions

- Automatically switches database to Postgres or MySQL

- Props available in CF environment for service connections
  - ${?cloud.services.mongo.connection.host}

- cloudfoundry-runtime lib for programmatic service connections

Sunday, December 9, 12

Demo

Play!ing with Cloud Foundry

Scala Support: Coming Soon

- Scala wrapper for cloudfoundry-runtime library
- SBT plugin for Cloud Foundry deployment
  - Already have maven plugin
- giter8 template
  - Blue Eyes for configuring web port and Mongo
  - Others?
- Additional Play auto-reconfig
- Scala wrapper for cloudfoundry-client-lib
- ???

Sunday, December 9, 12

Node.js on Cloud Foundry

• Node 0.4 and 0.6 runtimes

What's New

• Node 0.8

• NPM Support

  – Downloads and installs modules from npm-shrinkwrap.json

  – Brand new support for git modules

  – Modules with native dependencies installed correctly regardless of local packaging

Sunday, December 9, 12

Node.js: Auto-reconfiguration and cf-runtime

- **Apps using common node modules automatically connected to CF services**
  - Great for CF quick start with existing apps
- **cf-runtime module for finer control over svc connections**
  - Methods for obtaining app/service props and connections

```
// Obtain connection properties for single service of type Redis
app.serviceProps.redis
// Obtain connection properties for service named 'redis-service-name'
app.serviceProps['redis-service-name']
// Obtain the list of service names of specific type
app.serviceNamesOfType.redis
// Check if service of the given type is available
cf.RedisClient !== undefined
// Connect to a single service of type Redis
var redisClient = cf.RedisClient.create()
// Connect to redis service named 'redis-service-name'
var redisClient = cf.RedisClient.createFromSvc('redis-service-name')
```

Sunday, December 9, 12

Node Support: Coming Soon

- ???

Sunday, December 9, 12

Java on Cloud Foundry

- Spring, Grails, Java Web Apps with Java 6
- Auto-reconfiguration for Spring and Grails

What's New

- Java 7
- Standalone support
  - Spring Integration and Batch Workers
  - vert.x
  - Tomcat 7
  - Clojure, Groovy scripts, etc
- JRuby

Sunday, December 9, 12

Demo

Running workers on Cloud
Foundry with Spring

Java Support: Coming Soon

- Auto-reconfiguration of standalone Spring apps
- Choose container for Java web apps
  - i.e. Tomcat 6 or Tomcat 7
- ???

Sunday, December 9, 12

Runtimes and Frameworks: Coming Soon

- Runtime deprecation policy
- More frequent runtime upgrades
- More frequent addition of new runtimes
- Serve static assets directly from nginx
- TMPDIR set for all applications

Sunday, December 9, 12

What's New

Security and
Account Management

Sunday, December 9, 12

Cloud Controller NG

- Cloud Controller rewrite using Sinatra/Sequel
- More RESTful interaction
  - Navigation through hyperlink in payload
- Ability to pull in dependent objects in one call
  - Reduce roundtrips needed

Sunday, December 9, 12

DEA NG

- Uses "warden" to to provide container for app execution
  - Uses Linux cgroups
  - Primary goals: Isolation and Resource Control
  - Isolates CPU usage, memory usage, disk usage, and network access

Sunday, December 9, 12
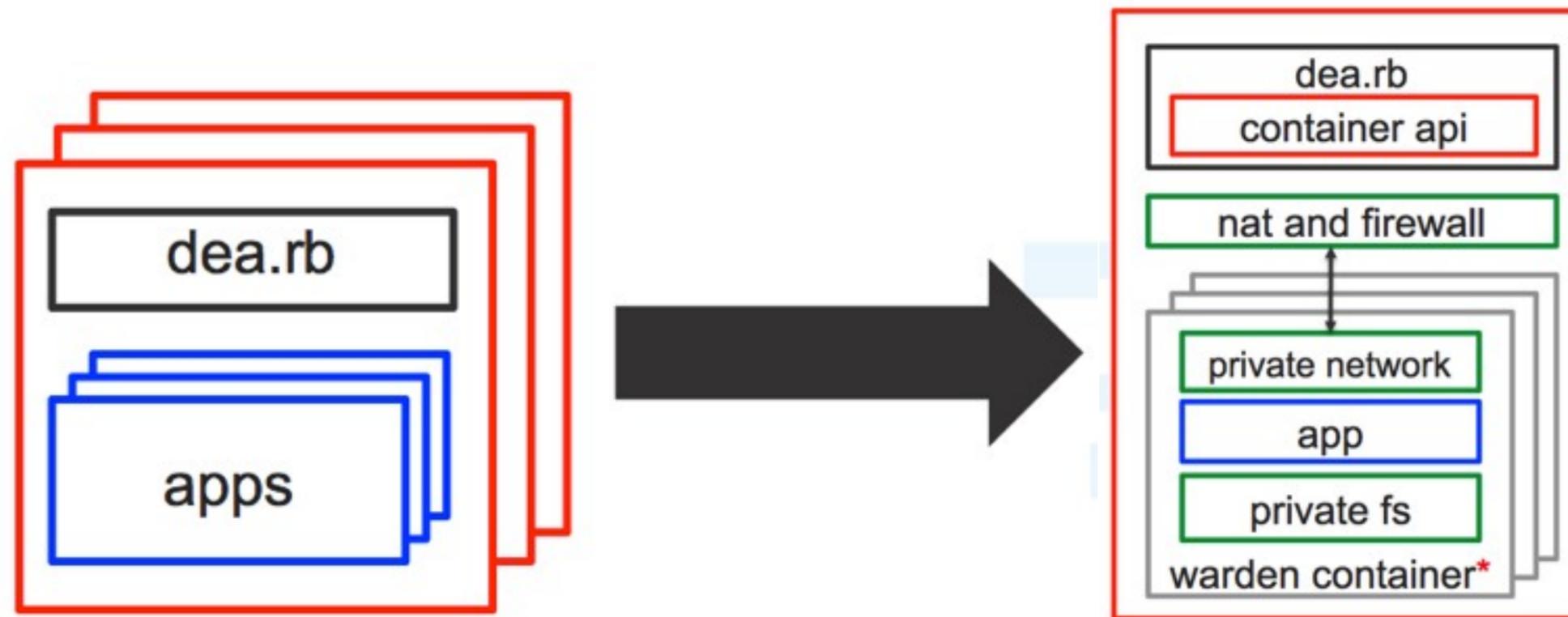
UAA (User Account and Authentication)

- Web app built with Spring and Spring Security

- Oauth2

- Pluggable authentication provider model

- Now running on CloudFoundry.com

Sunday, December 9, 12
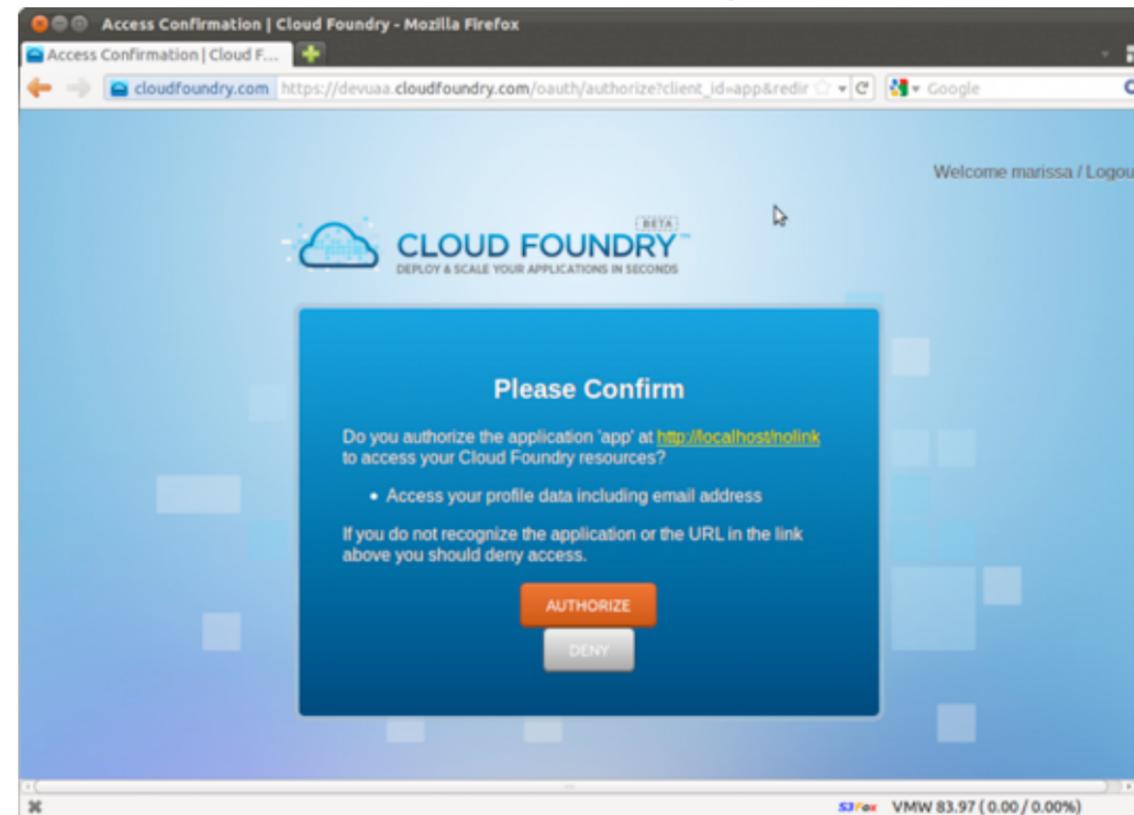
UAA High Level Features

- Centralized Identity Management
- Single Sign On
- Delegating Access to Services
- User Account Management
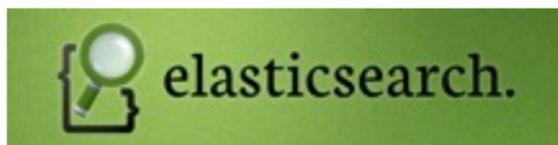- Client Application Registration

Sunday, December 9, 12

What's New

Services

Sunday, December 9, 12

Cloud Foundry Services
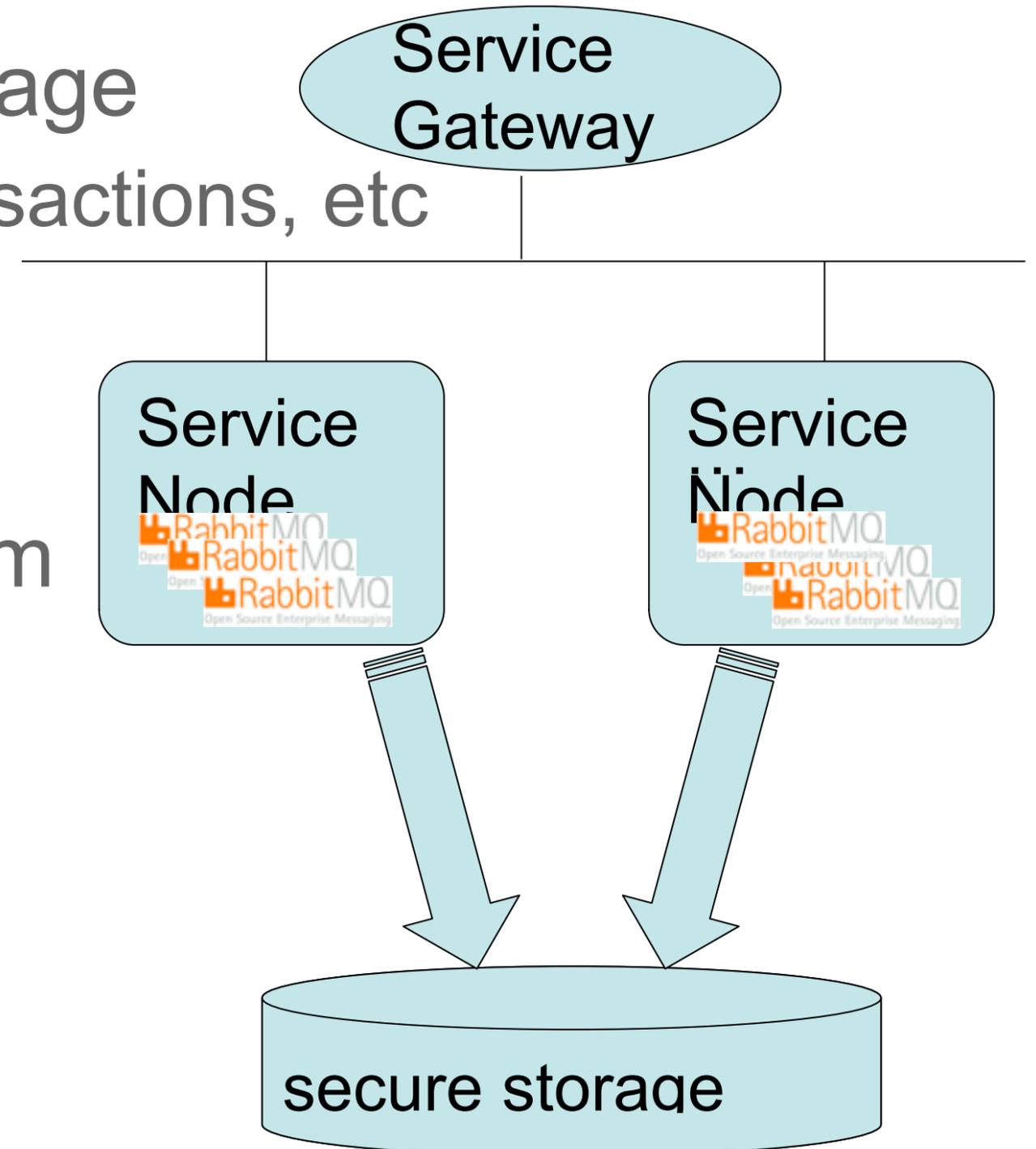
- CloudFoundry.com

- github.com/cloudfoundry

Filesystem

Blob

Sunday, December 9, 12

Backup

- Periodic data dump to secure storage
  - Use service's utilities to respect transactions, etc
- Automatic rotation
- Invisible to users
- Running today on cloudfoundry.com

Service Gateway

Service Node

Service Node

secure storage

Sunday, December 9, 12

Snapshots

- User-visible upload/download of service instance
  - Take a snapshot
  - Enumerate snapshots
  - Download a snapshot
  - Upload a snapshot (locally, cloud-to-cloud)
  - Switch to a snapshot

- Coming soon to CloudFoundry.com

Service Gateway

...

Service

Service

secure storage

Sunday, December 9, 12
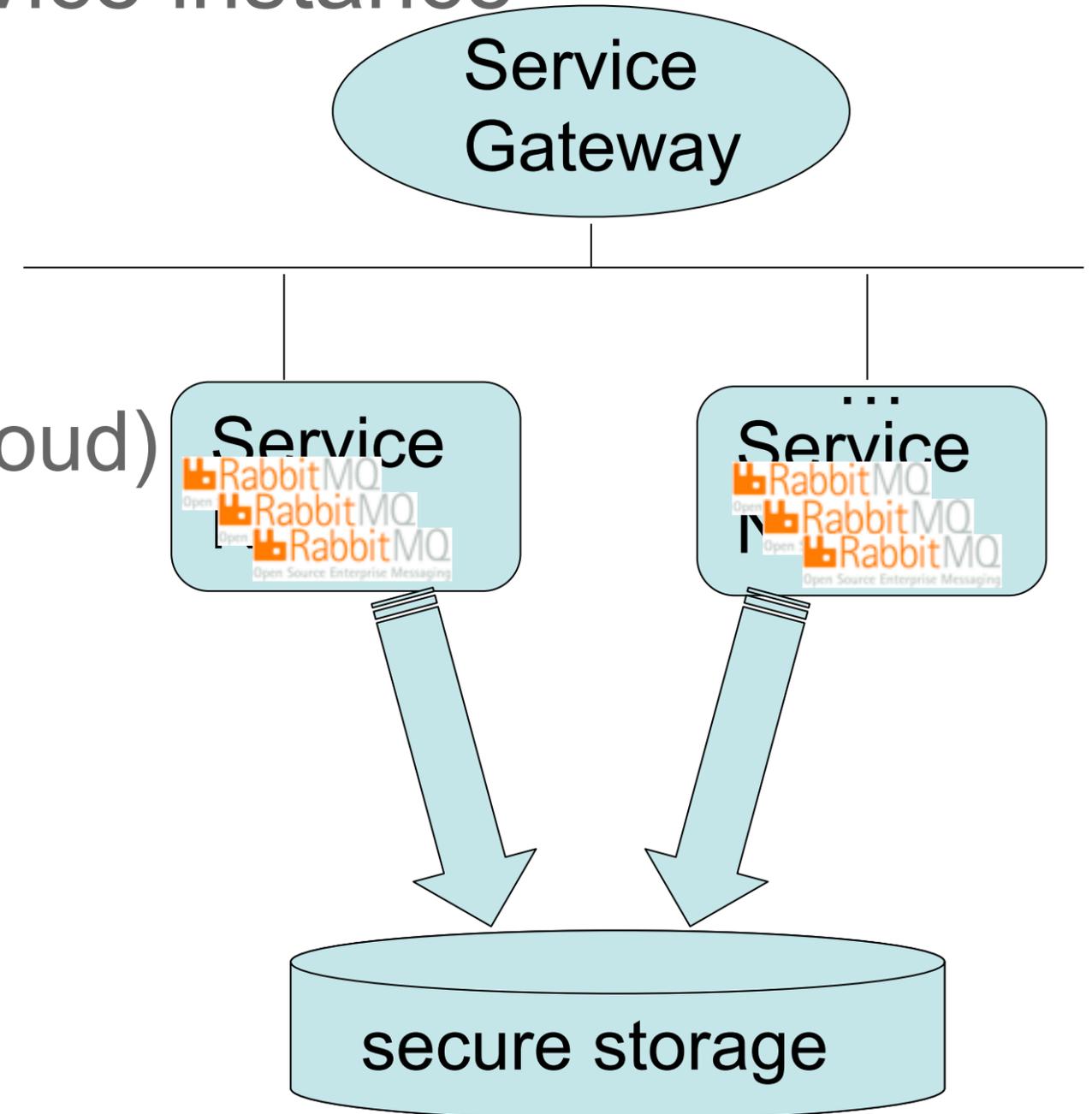
Warden

- Run each service in a sandbox to protect from a service's security flaws
- Warden: client/server on top of "cgroups"
- Services base library makes it easy to "wardenize" new services

- Coming soon to CloudFoundry.com

Versions

- Service gateways advertise different versions of a service to controller
- Service nodes advertise which versions they support to gateway
- User selects which version they want
- Gateway routes provision based on requested version (similar to plans)

- In progress on CloudFoundry.com

What's New

Tools

Sunday, December 9, 12

Introducing....vmc-ng

- Next generation of VMC, the CLI for Cloud Foundry
- Many interaction and architecture improvements
- Still under development
- gem install vmc --pre
- mkdir ~/.vmc/use-ng

Sunday, December 9, 12

vmc-ng: Improved interaction

- Shorter questions
- Tab completion
- Rewinding
- Better scripting support
- Better progress indicators

```
mightymouse:tentd-admin jencompgeek$ vmc push
Name> tentd

Instances> 1

1: rack
2: other
Framework> rack

1: ruby18
2: ruby19
3: other
Runtime> 2

URL> tentd.jencompgeek.cloudfoundry.me

1: 64M
2: 128M
3: 256M
4: 512M
5: 1G
Memory Limit> 128M

Creating tentd... OK
```

Sunday, December 9, 12

vmc-ng: Improved architecture

- Small core delegating to a separate high-level library
  - High level = "cfoundry" gem
  - cfoundry provides Object layer instead of parsed JSON
- Plugin architecture for extensions
  - Keeps vmc codebase clean and simple
  - Examples
    - caldecott
    - manifests

```
desc "delete [APP]", "Delete an application"
flag(:really) { |name|
  force? || ask("Really delete #{c(name, :blue)}?", :default => false)
}
def delete(name)
  return unless input(:really, name)

  with_progress("Deleting #{c(name, :blue)}") do
    client.app(name).delete!
  end
ensure
  forget(:really)
end
```
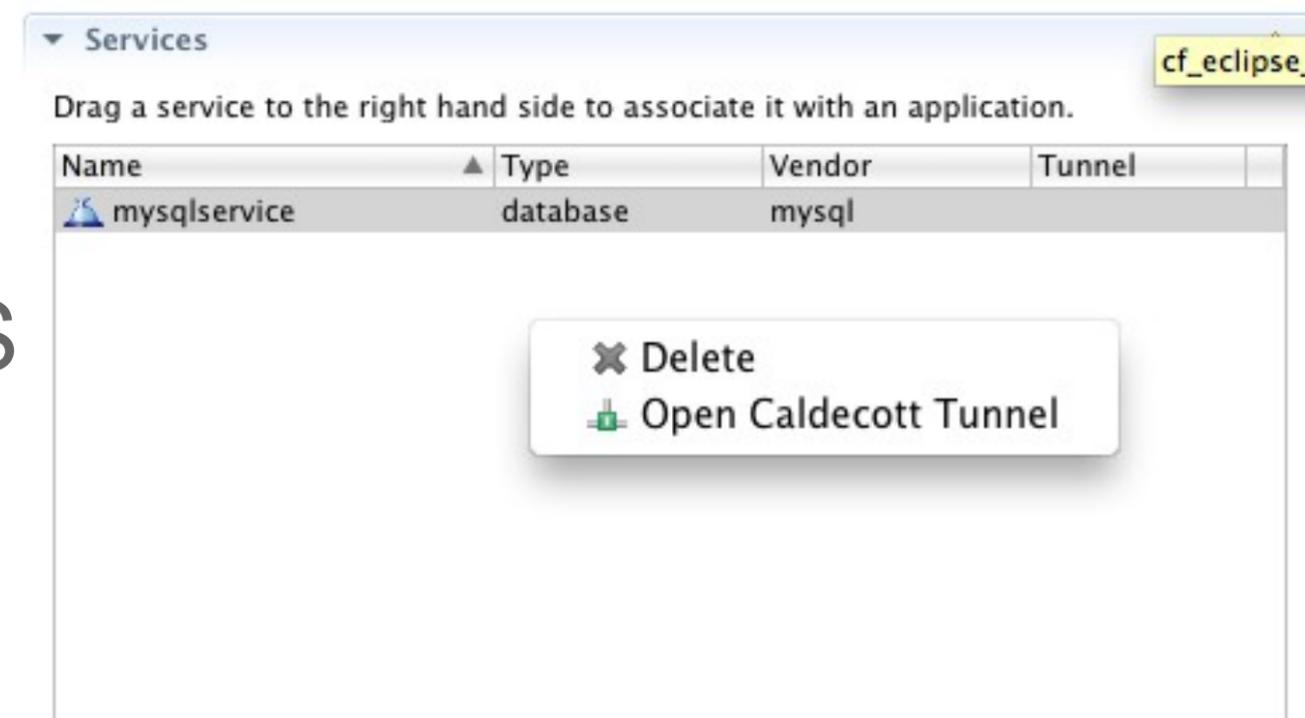
Sunday, December 9, 12

STS

- Deploy and debug Java web, Spring, Grails, Lift apps

What's New

- Deploy and debug standalone Java apps
  - Including Scala and Groovy
- Caldecott support
  - Tunnel to all services directly from STS

Sunday, December 9, 12

Demo

Deploying a standalone app with STS

Other Tools for Your Toolbox

- Java
  - cloudfoundry-client-lib
    - Java client to cc REST API
  - cloufoundry-maven-plugin
  - CF Gradle Plugin
  - cloudfoundry-caldecott-lib
    - Java library for tunneling to services
  - cloudfoundry-runtime

- Node
  - cf-runtime module

Sunday, December 9, 12

What's New

Micro
Cloud Foundry

Sunday, December 9, 12
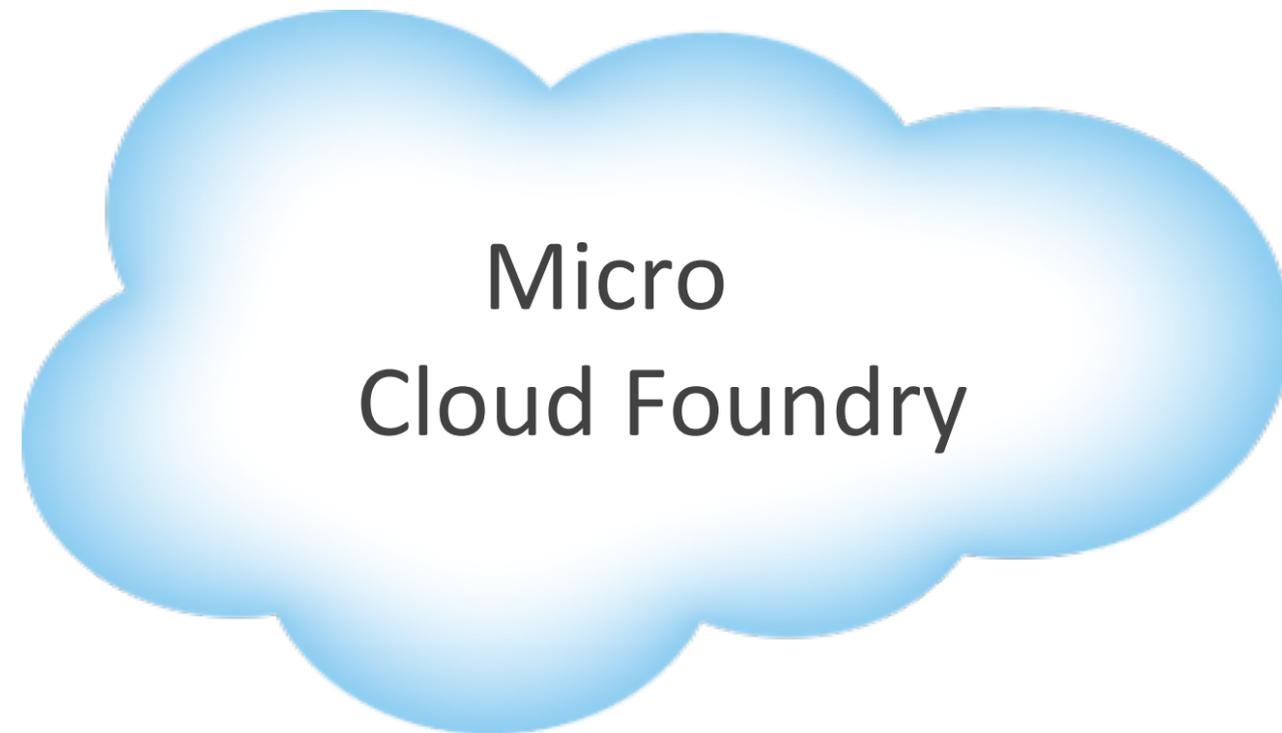
Micro Cloud Foundry

- Run a complete instance of CF on your computer using a VM image
- New release - up to date with latest cf.com

Coming Soon

- Improved process for more frequent releases
- Update mechanism
- REST API for configuration management
  - Functionality previously available in the MCF console
    - Password, DNS, Network, Service management
  - Manage MCF using vmc or other tools

Sunday, December 9, 12

What's New

CloudFoundry.com
Commercial Availability

Sunday, December 9, 12

CloudFoundry.com is coming out of beta

- Getting close to commercial availability of CloudFoundry.com

- Target: self-sufficient teams - 3-20 people

  - Designed for collaborative operation of applications

  - Including developers, architects, admins, QA, Ops, etc.

- Paid tier provides

  - Additional capacity, features

  - Paid by credit card

- Retain free tier

- Best place to deploy your Spring and Grails apps

Sunday, December 9, 12

Create, Collaborate, Control

- Web-based portal
- Collaboration capabilities
- Control cost

Sunday, December 9, 12

Web-based portal

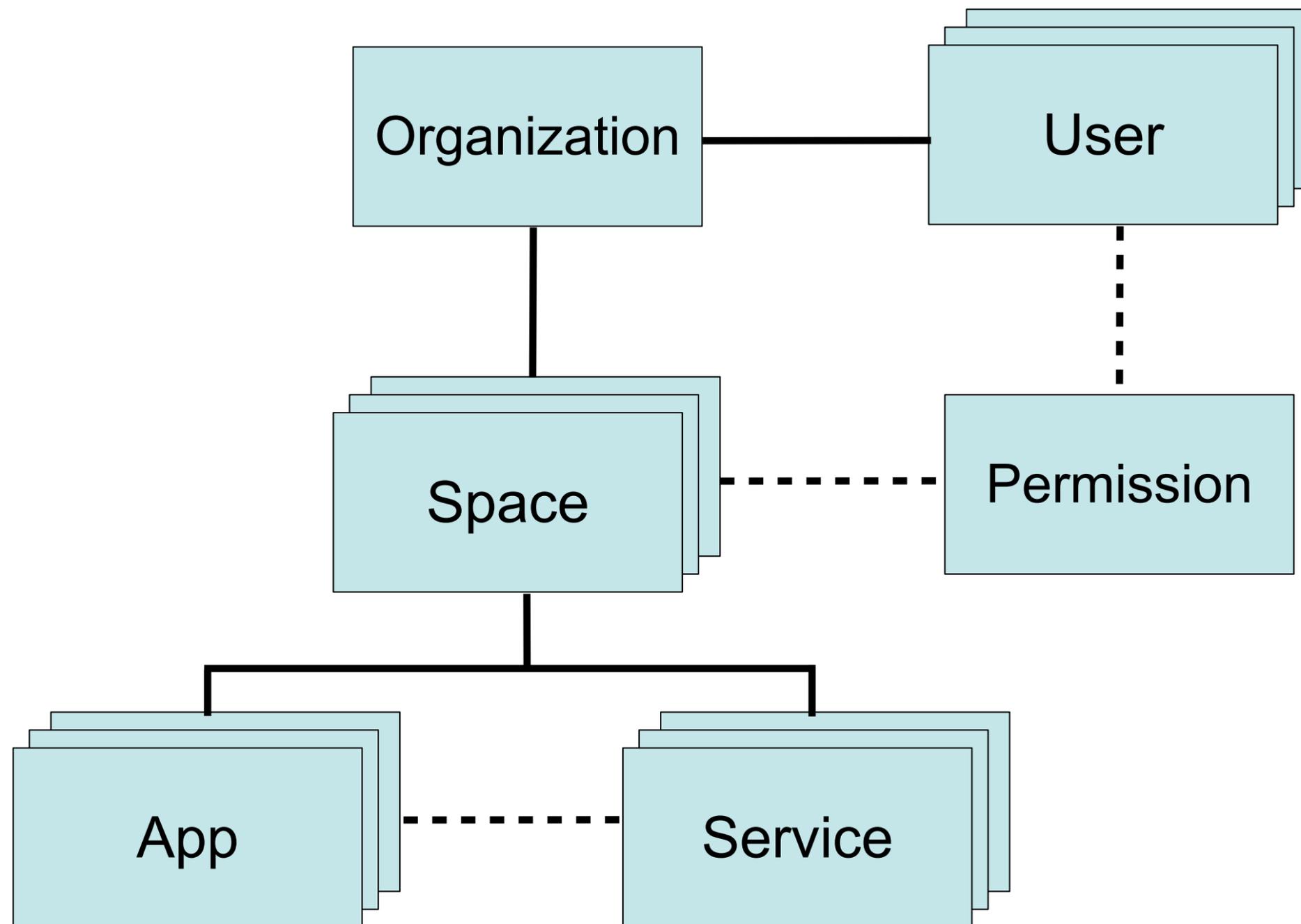- Create teams, assign roles

- Manage applications instances

- Provision an increased catalog of services

- Audit events and activities

Sunday, December 9, 12
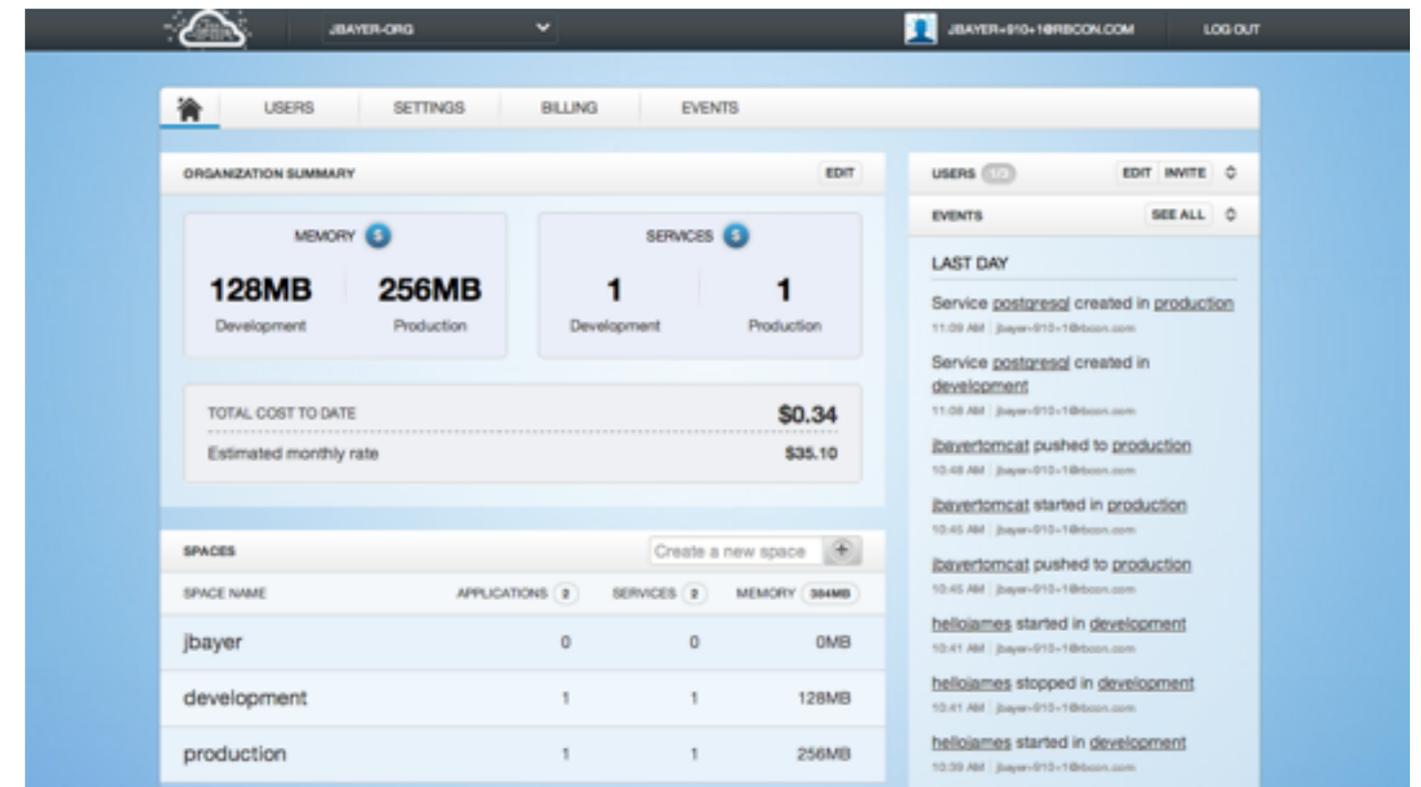
Operational Collaboration

Sunday, December 9, 12
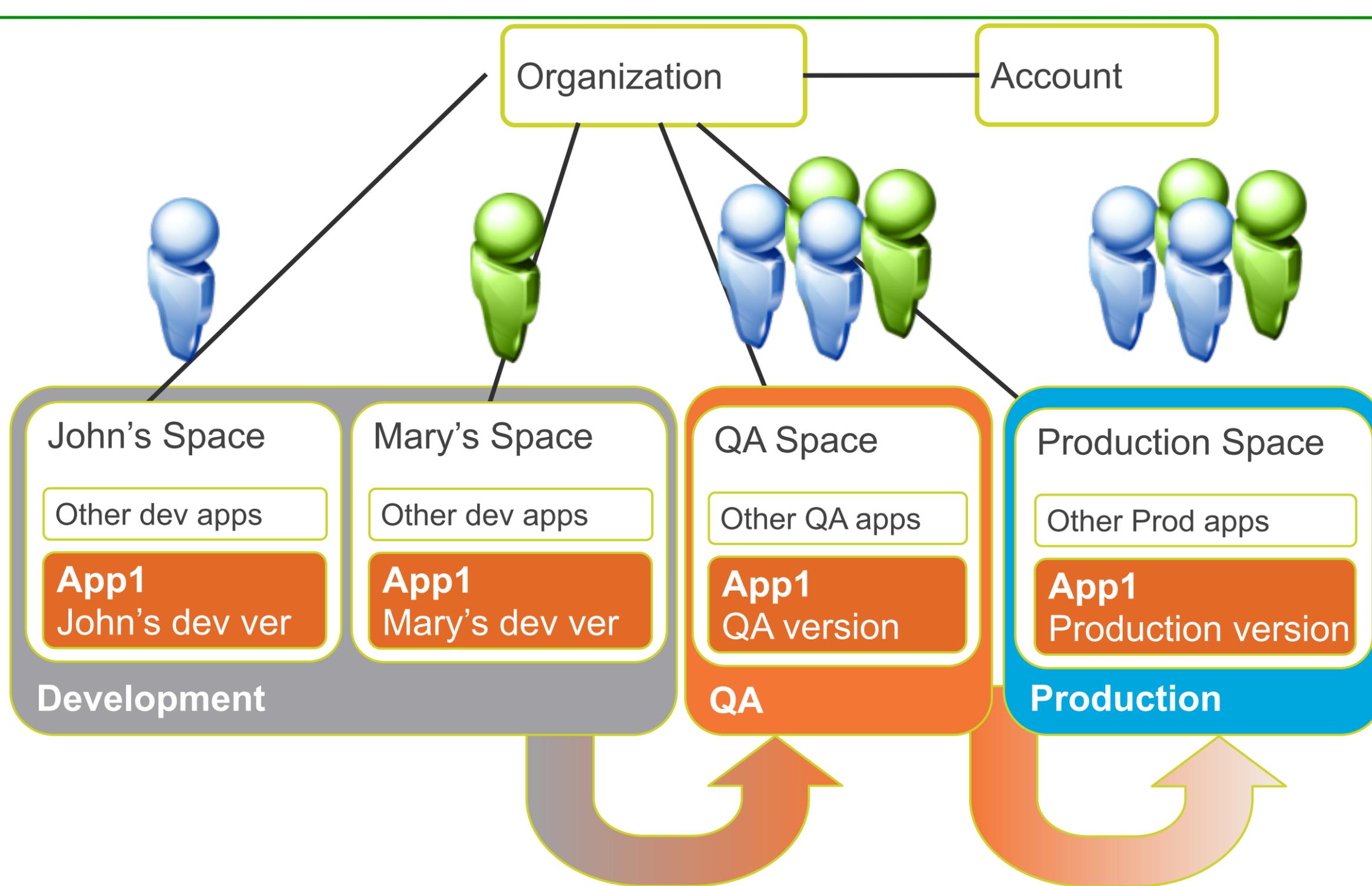
Collaboration Model

Sunday, December 9, 12

vmc-ng: Orgs and Spaces

```
# show my current context (cloud, org, and space)
$ vmc target
target: https://api.fakedomain.com
organization: pds
space: production

# switch to the staging space
$ vmc target -s staging
Switching to space staging... OK
target: https://api.fakedomain.com
organization: pds
space: staging

# switch to my other org
$ vmc target -o mhlsoft
Switching to organization mhlsoft... OK
Switching to space blaster... OK
target: https://api.fakedomain.com
organization: mhlsoft
space: blaster
```

Sunday, December 9, 12

Cost Management

- Manage your spending and resource consumption
- Configurable spending alerts across

Plans

- vmc create-service mysql --plan <plan>
- Plan = set of service parameters, configuration, options:
  - Size
  - Maximum concurrent connections
  - Query timeouts
  - Query cache size
- Service gateway route provision requests based on plan

- Coming soon to cloudfoundry.com

Sunday, December 9, 12
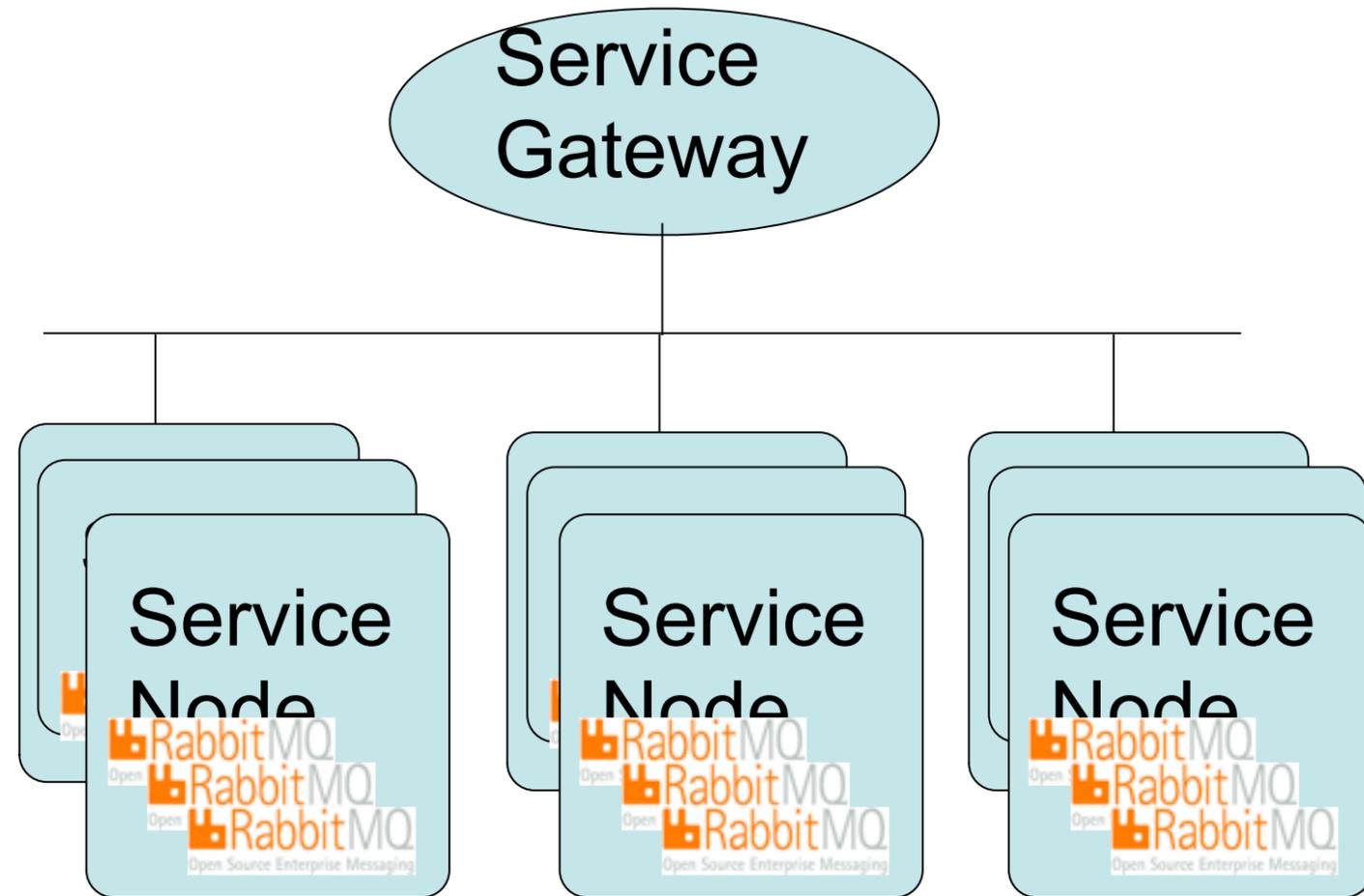
Single-Tenant Instances

- Today, cloudfoundry.com service nodes are multi-tenant (many instances hosted on a one node)

- Large/secure users might require that their service instance runs on their own dedicated node

- Plan parameter:

  –capacity = max number of instances

- Single-tenant Instances:
    capacity = 1

- Coming soon to cloudfoundry.com

Service Gateway

Service Node

Service Node

Service Node

Sunday, December 9, 12
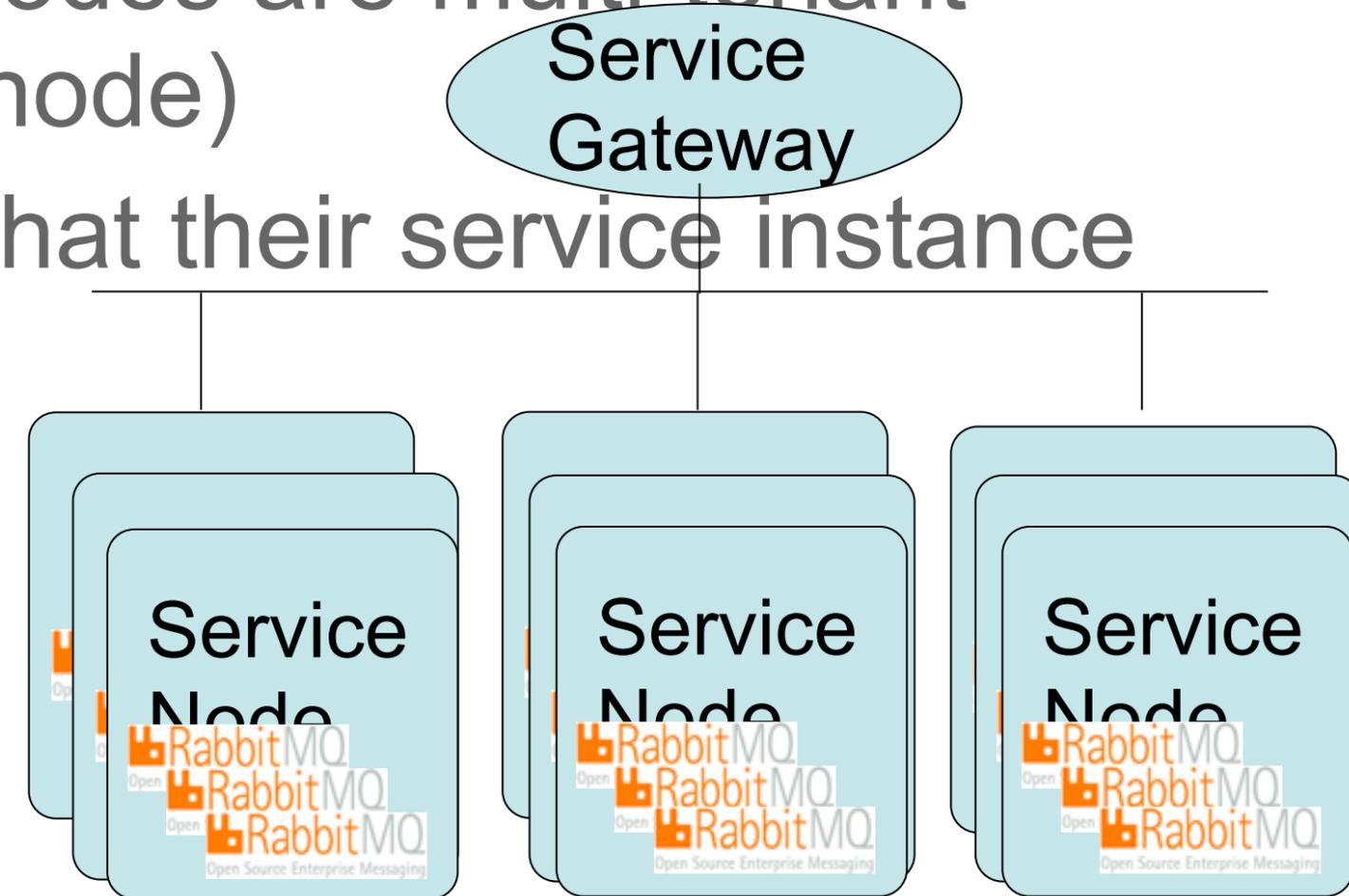
Platform to Grow with You

- Development Memory and Services
  - Inexpensive
  - Low performance
- Production Memory and Services
  - Paid option
  - Better performance

Sunday, December 9, 12

Demos

- Play!
  - https://github.com/playframework/Play20/tree/master/samples/java/zentasks

- Spring Integration Workers
  - https://github.com/cloudfoundry-samples/twitter-rabbit-socks-sample

- Unfiltered
  - https://github.com/cloudfoundry-samples/bitshow

Sunday, December 9, 12

Questions?

Sunday, December 9, 12

Cloud Foundry 启动营

在www.cloudfoundry.com注册账号并成功上传应用程序,

即可于12月8日中午后凭账号ID和应用URL到签到处换取Cloud Foundry主题卫衣一件。

Cloud Foundry 启动营

马上注册
领取主题卫衣

Sunday, December 9, 12

iPhone5 等你拿

第二天大会结束前，请不要提前离开，将填写完整的意见反馈表投到签到处的抽奖箱内，即可参与"iPhone5"抽奖活动。

Birds of a Feather 专家面对面

所有讲师都会在课程结束后，到紫兰厅与来宾讨论课程上的问题

来宾签到
Attendee Registration   VIP

Booth 2

Booth 3

Booth 10

Booth 9

Booth 4

Booth 8

Birds of a Feather
（紫兰厅 Violet）

Sunday, December 9, 12