

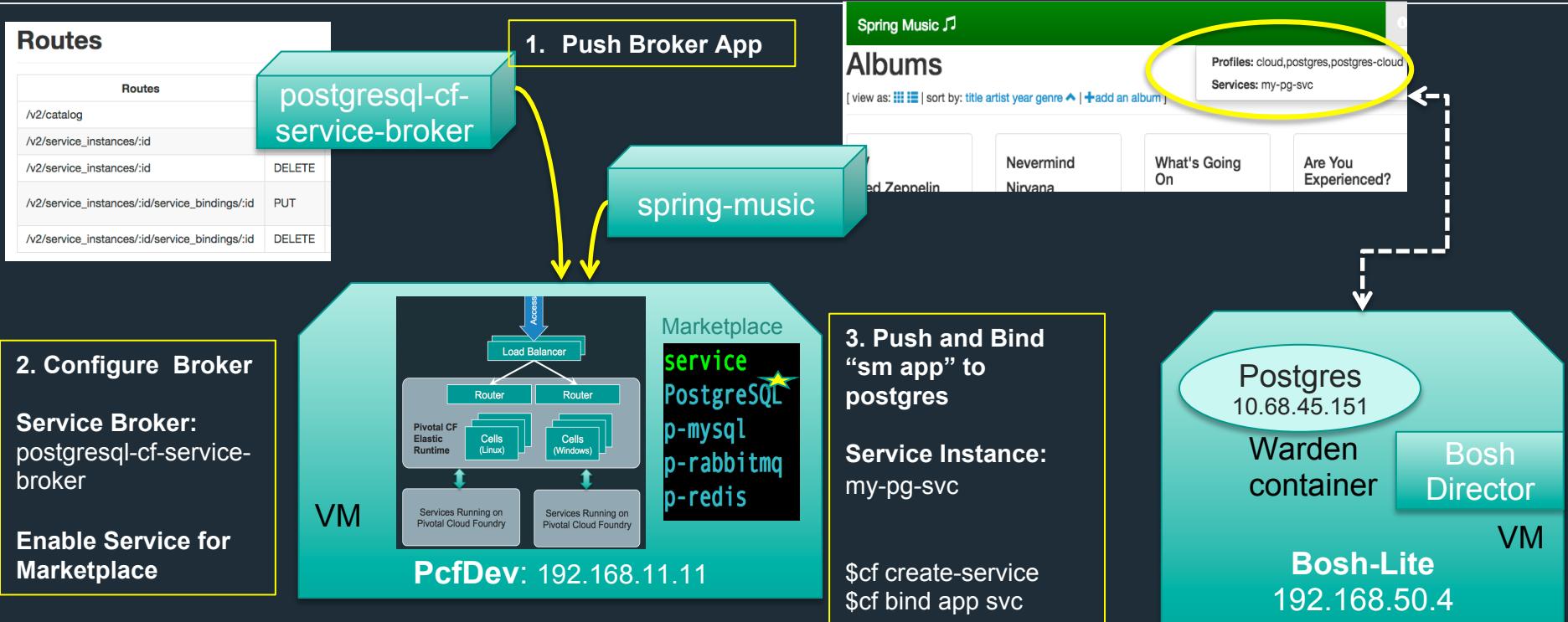
Pivotal.

# LAB 4:

## Deploy Existing Postgresql Service Broker



# Lab 4: Big Picture



Pivotal.

# Pivotal OpsManager and BOSH



# Pivotal OpsManager

Pivotal OpsManager is a web UI that installs and then sits on top of BOSH



# Pivotal OpsManager

Click to install & update

PCF Ops Manager frodenas ▾

Available Products

- Ops Manager Director  
No upgrades available
- Pivotal Elastic Runtime  
No upgrades available
- CloudBees Jenkins Enterprise  
15.11.01.02 ▾
- Redis  
1.5.2.0 ▾

Installation Dashboard

Ops Manager Director v1.6.4.0

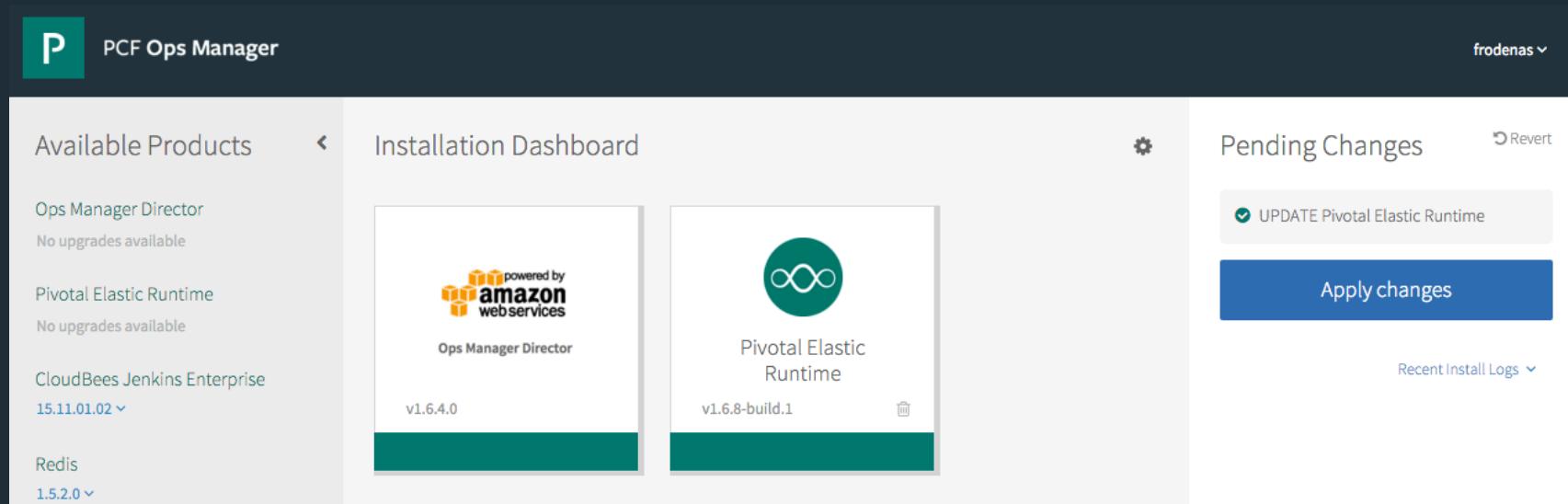
Pivotal Elastic Runtime v1.6.8-build.1

Pending Changes

UPDATE Pivotal Elastic Runtime

Apply changes

Recent Install Logs ▾



# Pivotal OpsManager

Simple interface allows a streamlined set up and configuration

Pivotal Elastic Runtime

Settings Status Credentials Logs

Assign Networks

Assign Availability Zones

System Database Config

File Storage Config

IPs and Ports

Security Config

MySQL Proxy Config

Cloud Controller

System Logging

SSO Config

LDAP Config

SMTP Config

Diego

Coordinates Pivotal CF Elastic Runtime application lifecycles

System Domain \*  This domain is used to target and push apps to Pivotal CF Elastic Runtime (ex: api.my-cf.com). You can change this later.

Apps Domain \*

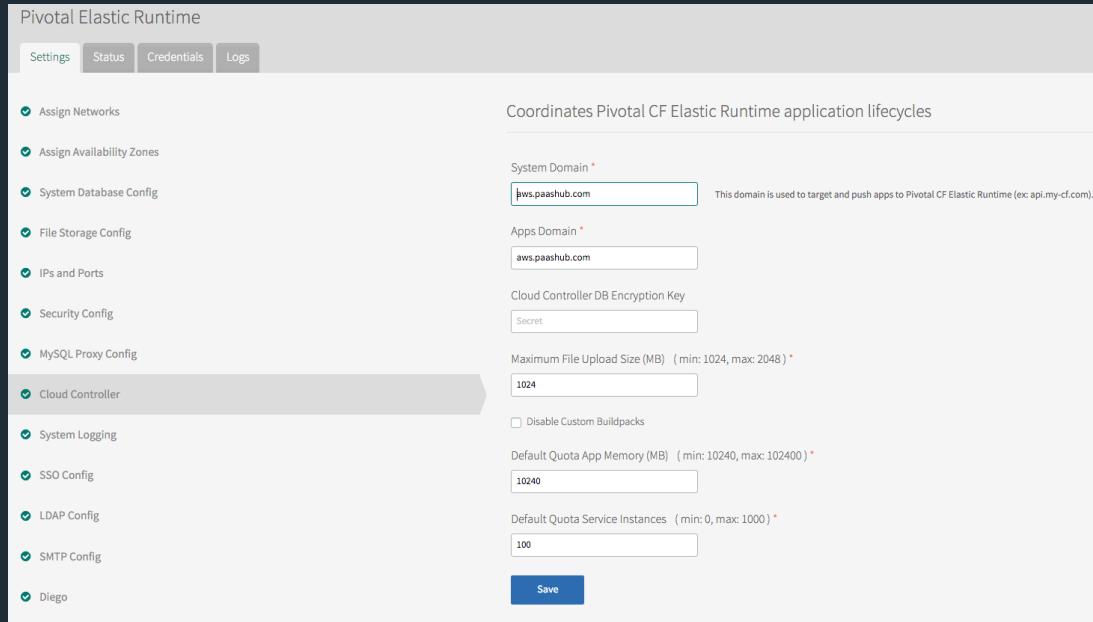
Cloud Controller DB Encryption Key

Maximum File Upload Size (MB) ( min: 1024, max: 2048 ) \*

Disable Custom Buildpacks

Default Quota App Memory (MB) ( min: 10240, max: 102400 ) \*

Default Quota Service Instances ( min: 0, max: 1000 ) \*



# Pivotal OpsManager

## Built-in platform monitoring

| Pivotal Elastic Runtime                |          |            |             |            |      |        |      |             |            |           |      |  |
|--|----------|------------|-------------|------------|------|--------|------|-------------|------------|-----------|------|--|
|  | Settings | Status     | Credentials | Logs       |      |        |      |             |            |           |      |  |
| Jobs on Availability Zone "us-east-1a" |          |            |             |            |      |        |      |             |            |           |      |  |
| JOB                                    | INDEX    | IPS        | CID         | LOAD AVG@5 | CPU  | MEMORY | SWAP | SYSTEM DISK | EPHEM.DISK | PERS.DISK | LOGS |  |
| NATS                                   | 0        | 10.0.16.11 | i-fabff4c   | 0.05       | 0.0% | 7%     | 0%   | 44%         | 3%         | N/A       |      |  |
| Consul                                 | 0        | 10.0.16.12 | i-818c8337  | 0.05       | 0.2% | 9%     | 0%   | 44%         | 10%        | 0%        |      |  |
| etcd                                   | 0        | 10.0.16.13 | i-a4bafe12  | 0.05       | 0.1% | 11%    | 0%   | 44%         | 6%         | 26%       |      |  |
| Diego BBS                              | 0        | 10.0.16.14 | i-05f2d7b3  | 0.05       | 0.3% | 13%    | 0%   | 44%         | 29%        | 28%       |      |  |
| Router                                 | 0        | 10.0.16.15 | i-f9bbff4f  | 0.05       | 0.0% | 9%     | 0%   | 44%         | 6%         | N/A       |      |  |
| Cloud Controller                       | 0        | 10.0.16.16 | i-6cbafeda  | 0.05       | 0.1% | 17%    | 0%   | 44%         | 11%        | 44%       |      |  |
| Clock Global                           | 0        | 10.0.16.17 | i-e4c58152  | 0.05       | 0.0% | 22%    | 0%   | 44%         | 35%        | N/A       |      |  |
| Cloud Controller Worker                | 0        | 10.0.16.18 | i-63c581d5  | 0.05       | 0.1% | 28%    | 0%   | 44%         | 43%        | 44%       |      |  |
| UAA                                    | 0        | 10.0.16.19 | i-99c5812f  | 0.05       | 0.2% | 43%    | 1%   | 44%         | 63%        | 44%       |      |  |
| Diego Brain                            | 0        | 10.0.16.20 | i-11c480a7  | 0.05       | 0.9% | 8%     | 0%   | 44%         | 20%        | 0%        |      |  |
|  | 0        | 10.0.16.21 | i-93c58125  | 0.05       | 0.1% | 2%     | 0%   | 44%         | 8%         | 44%       |      |  |
| Diego Cell                             | 1        | 10.0.16.22 | i-1bc581ad  | 0.05       | 0.0% | 3%     | 0%   | 44%         | 8%         | 44%       |      |  |
|  | 2        | 10.0.16.23 | i-2fc68299  | 0.05       | 0.1% | 2%     | 0%   | 44%         | 10%        | 44%       |      |  |
| Doppler Server                         | 0        | 10.0.16.24 | i-bfc68209  | 0.05       | 0.4% | 8%     | 0%   | 44%         | 5%         | N/A       |      |  |
| Loggregator/Trafficcontroller          | 0        | 10.0.16.25 | i-e5c78353  | 0.05       | 0.0% | 11%    | 0%   | 44%         | 17%        | N/A       |      |  |

# Pivotal OpsManager

## Credentials management

Pivotal Elastic Runtime

Settings Status Credentials Logs

| NAME               | CREDENTIALS   |
|--------------------|---|
| Smtp Credentials   | /   |
| Consul Encrypt Key | fa9daf8c8a4f271a6bd2  |
| Consul Agent Cert  | <pre>=====BEGIN RSA PRIVATE KEY=====MIIEpaIBAAKCAQEAglJxk6U6Ow0f18SE4MuZseiJS5AX6ArTlz4hp3QJkGbA6Vku bxVwPjensdqlLB91R2neVv+FaLmw1gPB81/LQ8mlD896NNNkk5e1Cygj9Cb6k4k/ 2y+6B8a4vHRYoSN2eOXjwZQE75EKVqHYLVPGRPtTcbAkfZL8+-fn1REqYHvhwvK z/RIBMKFjwHxdxtDEPKXhAdtj4jSV3JLNwvzFNWXD70XKy9GdJA/kYHfcfml9vhvR eM9WVVKf1bwCjPwvLcDnF7wEiKw3fPf0h9uA1JnW9hLk63u3m3WhnCL G1h-WWV4l1hWwAe8RzR9d1ngbpZc5JdF6X0wv3TzNgXkA5hAqBvBw14LkW7yQ p+sdTWXt+FQmekamDqoXTy7CyxaJh13fnvPmcgSG8GzndxDzBv8eC07J5SjvJw01 H43pGLAD0s/fxNFM6me1ndqf15OqeoX/cKy1rX5Yf02117BeFB/wx7Fz/1sGs1Kao y5JdJxjXk9ouf13Emn6nEdQXGGGcLpLwvPhHNBOU+qVv4LPxPgqdDIDr6iAhp0jn+yd NK5f7hb/rPVGjxouf1EEJbe0QGcyFg16taC/v9Na4lp17EbPNC1LqvqVcy+ReoucyBM 61ts-XN8v1z3likzXa1Ayutu0u21VNwXvYzN+p1Oyaabt6FoutTxKBx4OXBoY8X+ R8oXhJECyGAZAdidDjblthXny/cwX20KE4yPcc4aDu47X1l.175tF29VAjP7Rs/ Eri5dm12sa1kgQ0QV46Us+UecXBnw1zFGUmQNm0k3ZUppejJjm2JAlvFkAdR rByMFU-1c79DYTk0oJd0V3h11tpVgJo+j097glyuWQsyj1c1tywKCYgEayHLb RFw/eyMnBzD0y17a5u39c0c3sco8Iw4y7PfJdXJg0f2k6V7J1d8P8v0GdfL1 ocpG936/45yqbowV9hngp0931Mn-3UDGZ1de5gN1leg3xmcgj19cTwg6B79jP1.777 c7x0deteTP992FT0ca81ixcrXyAMu04fmBNH17TzMcgjBzOKnfG22LmRv/+9xIdRXN9 4rv7ftd7tV9pF1eYLj+8v4MGT7Fwsysc1VobhXKNgn9z1C1cq+jf101ckhXbmrmGUB muJXEKhNw4V7Vyouu2kCAzUj6j18kyyoleFddF15c1VDe5pJmkr8L770R02/+ANP0 Hyiis5ztGDRYRfr+5QUYQRQBgQcywz7z/lZjcdutVRQ9sd756t6iob8J09F7t+4WPVPM8 DxwR8Lauw+Uprguokxb0HCAFVDFcxLxpXY3kQuXj/g1wmJd21Gx0Me/+SDE EKvv/W9gxr4mdn7X2X606jCEERYyIzK9gf1gQom40fu1BzUzdptPxXYeHv0z OunNrwwBqC1Qdmh7Qk5B17av3kxpQnaEdjIqyVbDR0vX4wp2jUN7vUdrOBQUp HwJrUChEfQapp7dran7NMhRO1x56hhdhQ1asjqgs1p2XR2cS17JBjOpFyogKr 8ja01NW/+Up2Xhr0l1xydv7m0vzX34mX18ClasekWp5Q3o102w==</pre> =====END RSA PRIVATE KEY===== |

# Pivotal OpsManager

## Explore install logs

Installation Log for 12/19 00:04 UTC - 12/19 07:33 UTC

Show plain text

```
{"type": "step_started", "id": "bosh_micro.setting_manifest"}  
2015-12-19 00:04:27 UTC Running "bundle exec bosh -n micro deployment /var/tempest/workspaces/default/deployments/bosh_micro_manifest.yml"  
Deployment set to "/var/tempest/workspaces/default/deployments/bosh_micro_manifest.yml"  
{"type": "step_finished", "id": "bosh_micro.setting_manifest"}  
{"type": "step_started", "id": "bosh_micro.deploying"}  
2015-12-19 00:04:32 UTC Running "bundle exec bosh -n micro deploy /var/tempest/stemcells/light-bosh-stemcell-3146-aws-xen-hvm-ubuntu-trusty-go_agent.tgz --update-if-exists"  
  
Verifying stemcell...  
File exists and readable OK  
Verifying tarball...  
Read tarball OK  
Manifest exists OK  
Stemcell image file OK  
Stemcell properties OK  
  
Stemcell info  
-----  
Name: bosh-aws-xen-hvm-ubuntu-trusty-go_agent  
Version: 3146  
  
Will skip deploy due to no changes  
log writing failed. can't be called from trap context  
Deployed 'bosh_micro_manifest.yml' to 'Unknown Director', took 00:00:02 to complete  
2015-12-19 00:04:38 UTC Running "bundle exec bosh -n micro status"  
Stemcell CID ami-015fid6b light  
Stemcell name light-bosh-stemcell-3146-aws-xen-hvm-ubuntu-trusty-go_agent  
VM CID i-3f83f989  
Disk CID vol-17t4fafaf4  
Micro BOSS CID bm-81e10fc-8dd4-4e42-8946-8c2162f38ef9  
Deployment /var/tempest/workspaces/default/deployments/bosh_micro_manifest.yml  
Target https://10.0.16.10:2555  
{"type": "step_finished", "id": "bosh_micro.deploying"}  
{"type": "step_started", "id": "bosh micro.logging into director"}
```

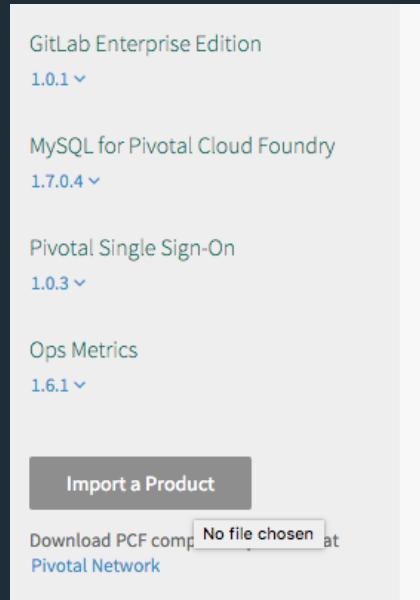
# Pivotal OpsManager

## Scale the platform

| Resource Config                      |           |                     |                      |               |      |
|--------------------------------------|-----------|---------------------|----------------------|---------------|------|
| JOB                                  | INSTANCES | EPHEMERAL DISK (MB) | PERSISTENT DISK (MB) | INSTANCE TYPE | EDIT |
| NATS                                 | 1         | 2048                | 0                    | t2.micro      | ▼    |
| Consul                               | 1         | 2048                | 1024                 | t2.micro      | ▼    |
| etcd                                 | 1         | 2048                | 1024                 | t2.micro      | ▼    |
| Diego BBS                            | 1         | 2048                | 1024                 | t2.micro      | ▼    |
| NFS Server                           | 0         | 2048                | 102400               | t2.micro      | ▼    |
| Router                               | 1         | 2048                | 0                    | t2.micro      | ▼    |
| MySQL Proxy                          | 0         | 4096                | 0                    | t2.micro      | ▼    |
| MySQL Server                         | 0         | 30000               | 100000               | r3.large      | ▼    |
| Cloud Controller Database (Postgres) | 0         | 2048                | 2048                 | t2.micro      | ▼    |
| UAA Database (Postgres)              | 0         | 2048                | 8192                 | t2.micro      | ▼    |
| Apps Manager Database (Postgres)     | 0         | 2048                | 1024                 | t2.micro      | ▼    |

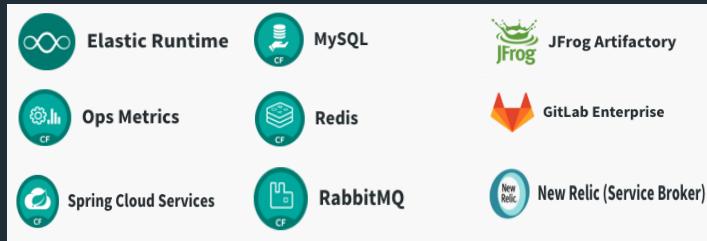
# Pivotal OpsManager

Easily import new products



# Pivotal Network

Pivotal Network provides a rich set of products for Pivotal OpsManager



<https://network.pivotal.io/>

# Pivotal Product

```
p-mysql-1.7.0.4.pivotal/
├── content_migrations
|   └── migrations.yml ← Migration from previous versions
├── metadata
|   └── p_mysql.yml ← Manifest templates and UI rendering
└── releases
    ├── cf-mysql-24.tgz
    ├── mysql-backup-1.tgz ← BOSH releases
    └── service-backup-1.tgz
```

# Pivotal Product UI rendering

The screenshot shows a web-based configuration interface for a MySQL service plan. On the left, a sidebar lists several configuration steps: Assign Networks (checked), Assign Availability Zones (unchecked), Service Plan (checked), Proxy (checked), Configure Backups (unchecked), Errands (checked), Resource Config (checked), and Stemcell (checked). The main area is titled "MySQL Service Plan Configuration". It contains two input fields: "Max Storage (MB)" with a value of "100" and "Max Concurrent Connections" with a value of "40". A "Save" button is located below these fields. To the right of the form, a large block of JSON-like configuration code is displayed, detailing the properties and descriptions for the "Max Storage (MB)" and "Max Concurrent Connections" fields.

```
form_types:
- name: service_plan
  label: Service Plan
  description: MySQL Service Plan Configuration
  property_inputs:
    - reference: ".cf-mysql-broker.plan_1_max_storage_mb"
      label: Max Storage (MB)
      description: This value is the maximum storage on disk permitted per database.
      When this quota is exceeded, write permissions are revoked until storage utilization falls below the quota. Users can discover current storage utilization on the service dashboard.
    - reference: ".mysql.max_user_connections"
      label: Max Concurrent Connections
      description: This value is the maximum number of concurrent connections per user.
      A unique user is created for each bound application. Connections are dropped when this quota is exceeded. The server maximum is 1500.
```

# Pivotal Product manifest templates

```
property_blueprints:  
- name: vm_credentials  
  type: salted_credentials  
  label: VM credentials  
  default:  
    identity: vcap  
- name: mysql_admin_password  
  type: simple_credentials  
  label: MySQL root password  
  default:  
    identity: root  
- name: mysql_backup_server_credentials  
  type: simple_credentials  
  label: Backup Endpoint Credentials  
- name: max_user_connections  
  type: integer  
  default: 40  
  configurable: true  
manifest: |  
  admin_password: (( mysql_admin_password.password ))  
  max_connections: 1500  
  max_user_connections: (( max_user_connections.value ))  
  innodb_buffer_pool_size: 2147483648  
  database_startup_timeout: 600  
  cluster_ips: (( .mysql.ips ))  
  network_name: default  
  persistent_disk: (( .mysql.persistent_disk ))  
  syslog_aggregator:  
    address: (( ..cf.properties.syslog_host.value ))  
    port: (( ..cf.properties.syslog_port.value ))  
    transport: (( ..cf.properties.syslog_protocol.value ))  
  mysql-backup:  
    command: innobackupex --user=(( mysql_admin_password.identity )) --password=(( mysql_admin_password.password )) --stream=tar tmp/  
    port: 8081  
    credentials:  
      username: (( mysql_backup_server_credentials.identity ))  
      password: (( mysql_backup_server_credentials.password ))
```

Pivotal.

# Cloud Foundry Service Broker And Marketplace



# Services Overview

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1. Operations
2. Service Marketplace
3. Developer Experience

# What is a Service?

- Allows resources to be easily provisioned on-demand.
- Typically middleware, frameworks, and other “components” necessary for applications.
- Can be a persistent, stateful layer



# 2 types of Services

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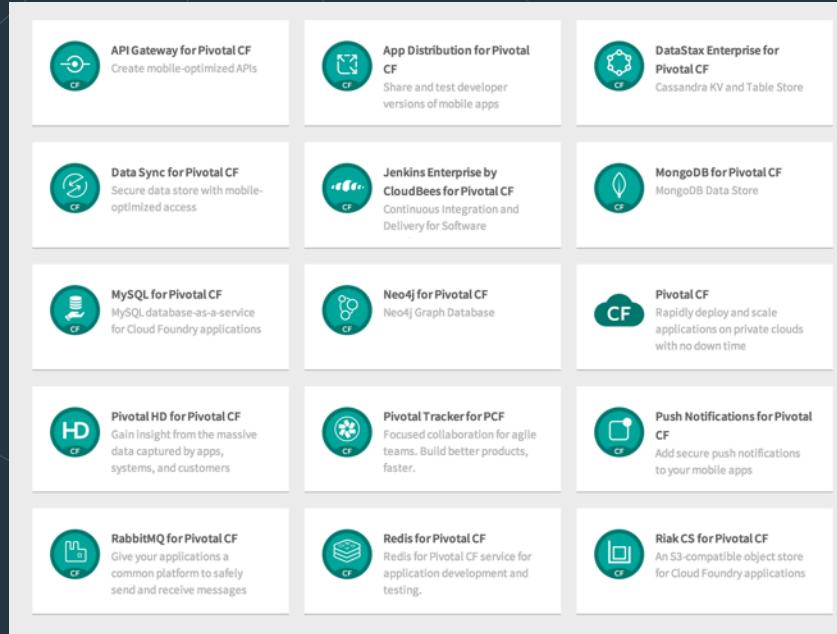
- **Managed** – Fully integrated, with fully lifecycle management
- **User-Provided** – Created and managed externally to the Platform.

# Managed Services

**Managed Services** are integrated with PCF by implementing a documented API.

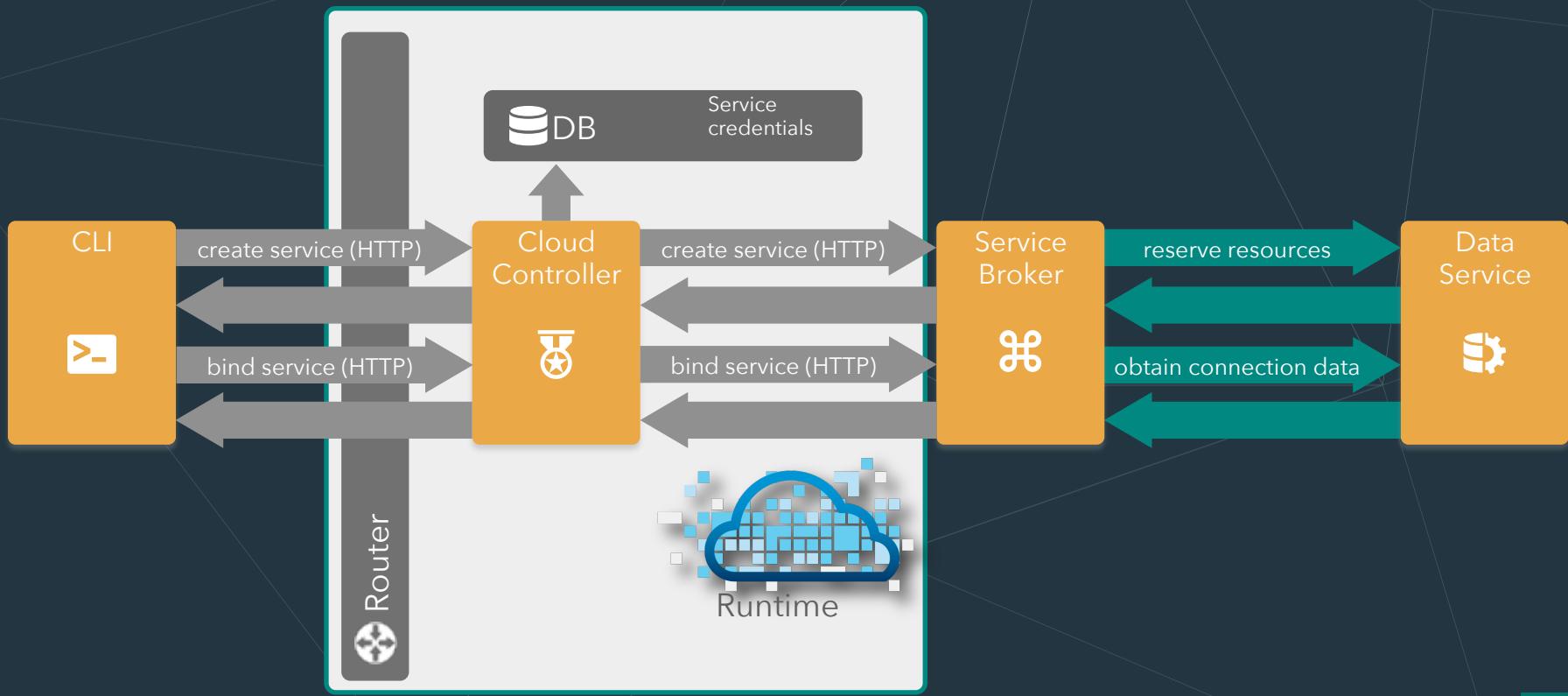
A **self-service** catalog of databases, analytics and middleware technologies:

- Production ready
- Integrated lifecycle management
- Managed credentials
- Role-based access



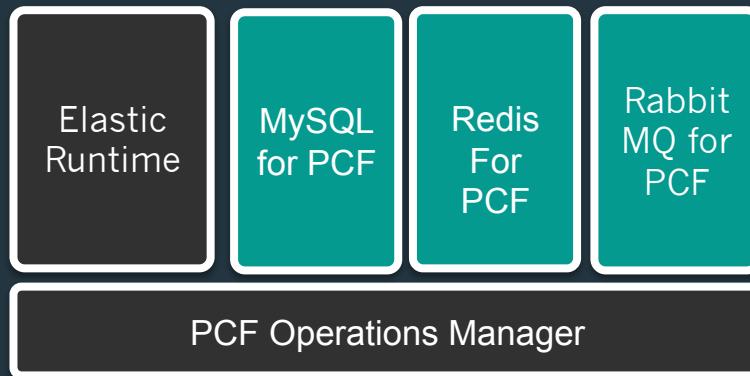
**Service Broker** is a component which implements the Service API. Service brokers advertise a catalog of service offerings and service plans to Cloud Foundry.

# Service Creation & Binding



# Why Pivotal Cloud Foundry Services

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Elastic Runtime integrated into leading data services; all scaled and managed by PCF Ops Manager

- Operated ‘as a Service’
- Configured and integrated to enable push button deployment.
- Full lifecycle management - software updates and patching
- Bind to apps through an easy-to-use interface
- Common view into access control and audit trails across a breadth of services

# And much more...

## HIGHLY AVAILABLE

As an Application Developer, I expect my services to be resilient to failure, so that my application maintains uptime.

## AZ SUPPORT

As an Operator, I want to deploy services across different IaaS Availability Zones, so that an AZ failure does not take the whole service offline

## ROLLING DEPLOYMENT

As an Application Developer, I do not expect to experience a prolonged outage during a deployment of the service, so that I can maintain uptime..

## AUTOMATED VERSION UPDATES

I expect all components of a service to be upgraded to the latest versions automatically through OpsManager, so that I do not have to perform any manual steps.

## OPERATIONAL MONITORING & LOGGING

As an Operator, I want visibility into the operational health, performance and logs of my services, so that i can monitor their uptime and diagnose any issues

## BACKUP & RESTORE

As an Operator, I expect all services to be able to be backed up and restored, so that I can provide disaster recovery facilities

## SCALE

As an Operator, I expect my services to operate at scale, so that i can handle large workloads.

MORE..

# Pivotal Cloud Foundry Service

## Mobile



API  
Gateway



Push  
Notifications



Data Sync



App  
Distribution

## Datastore



Redis



DataStax  
Cassandra



MySQL



GemFire



Session  
state  
caching



PivotalHD  
(BETA)



Neo4j  
(BETA)

MongoDB  
(BETA)

## Other



RabbitMQ



Jenkins  
Enterprise  
by  
CloudBees



Spring XD  
(BETA)



Single Sign-  
on

## Cloud-native



Config  
Server



Service  
Directory



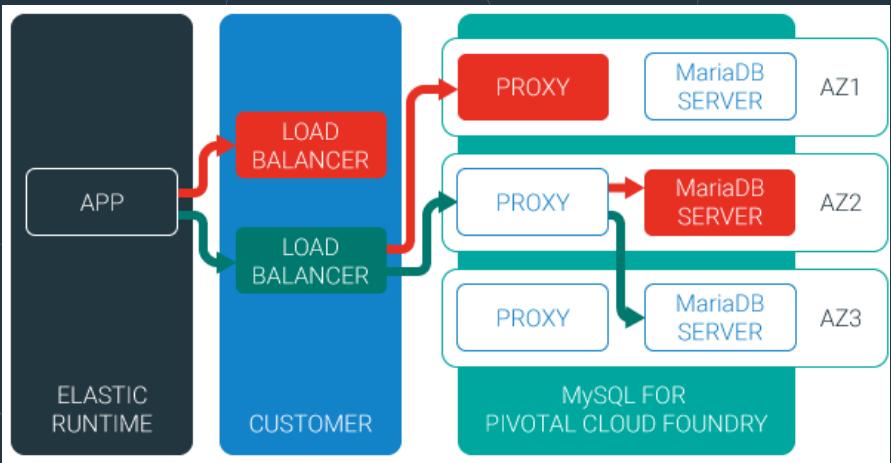
Circuit  
Breaker

# Example: MySQL Service



## Relational Database as a service

- Minimized effort to create, configure, and manage a MySQL cluster
- Multi-node cluster
- Data replication across nodes
- Failover functionality ensures app traffic only routed to healthy nodes



# CUSTOM SERVICES IN PCF

# 3 options

---

**Service Broker**

- A simple and consistent way to access services that may be running on top of Cloud Foundry, controlled by Cloud Foundry or running totally independently of Cloud Foundry.
- 5 RESTful APIs
- Expose services in the marketplace

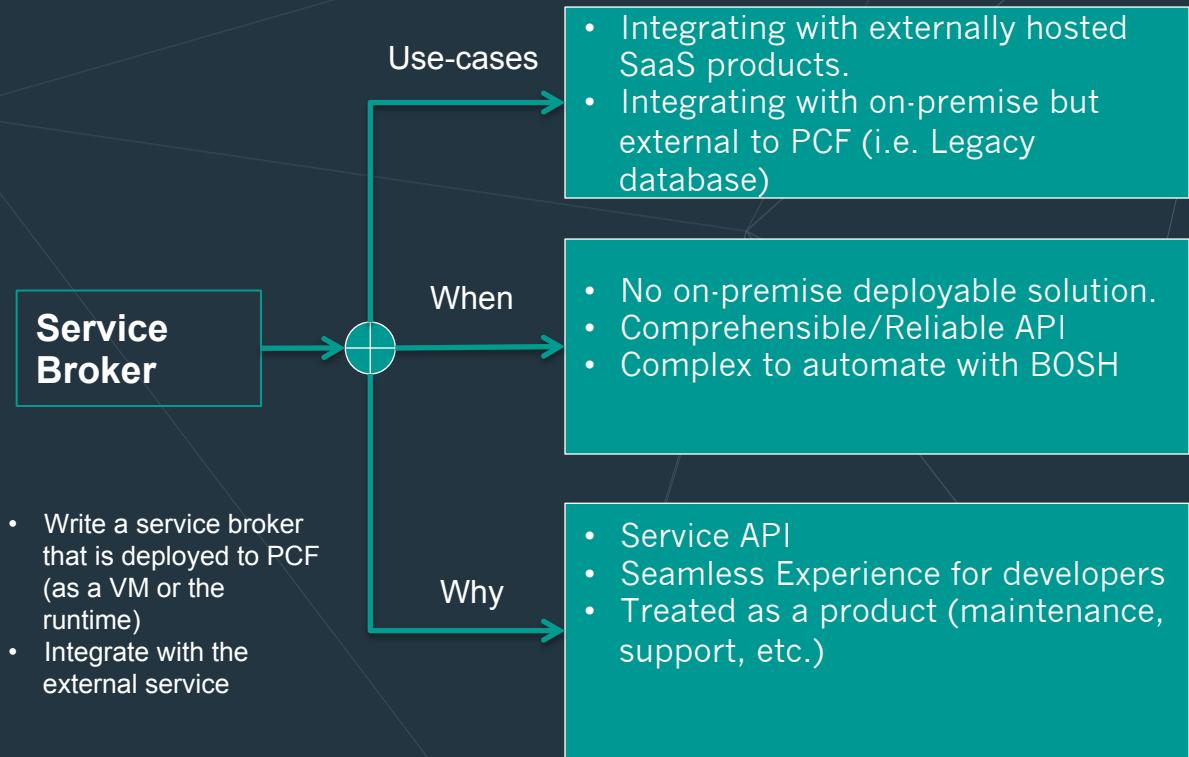
**Custom PCF Tile**

- Service instance managed inside Pivotal Cloud Foundry.
- Most of the time uses a Service Broker.
- Enterprise grade services.
- Same experience as PCF Products

**User-Provided**

- Service instance which have been provisioned outside of Cloud Foundry.
- Behave like other service instances once created.
- Eliminate the need to hard code service instance endpoints.

# Service broker



# Service Broker API

---

`/v2/catalog [GET]`

`/v2/service_instances/:id [PUT]`

`/v2/service_instances/:instance_id/service_bindings/:id [PUT]`

`/v2/service_instances/:instance_id/service_bindings/:id [DELETE]`

`/v2/service_instances/:id [DELETE]`

# DEVELOPER EXPERIENCE

# Example: Service Creation & Binding

- Create Service
- Bind service
- Restart App
- Verify

Click on "Marketplace"

The screenshot shows the Pivotal Apps Manager interface. On the left, there's a sidebar with 'ORG' set to 'schabiy0' and 'SPACES' showing 'development' and 'Marketplace'. An orange arrow points from the text 'Click on "Marketplace"' to the 'Marketplace' button in the sidebar. The main area displays an application named 'pcfdemo' with a configuration section and a status section.

**CONFIGURATION**

| Instances | Memory Limit | Disk Limit |
|-----------|--------------|------------|
| 1         | 512 MB       | 1 GB       |

**STATUS**

| # | STATUS  | CPU | MEMORY | DISK   | UPTIME |
|---|---------|-----|--------|--------|--------|
| 0 | Running | 0%  | 348 MB | 138 MB | 0 min  |

**ABOUT**

BUILDPACK: java-buildpack=v3.0-offline-https://github....  
START CMD: Set by the buildpack  
STACK: cflinuxfs2 (Cloud Foundry Linux-based file...)

Events Services Env Variables Routes Logs Delete App

# Example: Service Creation & Binding

- **Create Service**
- Bind service
- Restart App
- Verify

Choose "RabbitMQ for PCF"

The image shows a screenshot of the Pivotal Cloud Foundry Services Marketplace. The title 'Services Marketplace' is at the top. Below it, there are four service cards arranged in a grid. An orange arrow points to the first card, which is for 'RabbitMQ for PCF'. The card has a teal icon with a white rabbit and the letters 'CF'. The text reads: 'RabbitMQ for PCF' and 'RabbitMQ is a robust and scalable high-performance multi-protocol messaging broker.' To the right of this card is another card for 'MySQL for Pivotal Cloud Foundry' with a teal icon of a dolphin and the letters 'CF'. Below these are two more cards: 'Riak CS for Pivotal Cloud Foundry' with a teal icon of a square and the letters 'CF', and 'Redis for PCF' with a teal icon of a stack of boxes and the letters 'CF'. To the right of these are two more cards: 'API Gateway Service' with a teal icon of a circular arrow and the letters 'CF', and 'App Distribution' with a teal icon of a mobile phone and the letters 'CF'. The entire interface has a light gray background with white text and teal icons.

**Services Marketplace**

**RabbitMQ for PCF**  
RabbitMQ is a robust and scalable high-performance multi-protocol messaging broker.

**Riak CS for Pivotal Cloud Foundry**  
An S3-compatible object store based on Riak CS

**Redis for PCF**  
Redis service to provide a key-value store

**MySQL for Pivotal Cloud Foundry**  
MySQL service for application development and testing

**API Gateway Service**  
API Gateway Service allows you to rapidly transform and aggregate APIs

**App Distribution**  
Share and test developer versions of mobile applications.

# Example: Service Creation & Binding

- **Create Service**
- Bind service
- Restart App
- Verify

Select the free plan

The screenshot shows the RabbitMQ for PCF service page. At the top, there's a logo with a blue circle containing a white icon and the letters 'CF'. To its right, the service name 'RabbitMQ for PCF' is displayed in bold black text. Below the name, a brief description states: 'RabbitMQ is a robust and scalable high-performance multi-protocol messaging broker.' On the right side, under 'ABOUT THIS SERVICE', it says 'RabbitMQ is a robust and scalable high-performance multi-protocol messaging broker.' and provides links to 'Documentation' and 'Support'. Under 'COMPANY', it lists 'Pivotal'. In the center, there's a section titled 'SERVICE PLANS' with two tabs: 'Production' and 'free'. The 'free' tab is selected, highlighted in light blue. Below the tabs, there's a list of 'PLAN FEATURES' with two items: 'RabbitMQ 3.3.5' and 'Multi-tenant'. At the bottom of this section is a button labeled 'Select this plan' in blue text. An orange arrow points from the text 'Select the free plan' at the top of the slide to this 'Select this plan' button.

# Example: Service Creation & Binding

Give it a name and bind it to your application

- Create Service
- Bind service
- Restart App
- Verify

The screenshot shows the PCF service catalog interface. At the top, there's a search bar with the placeholder "Search services" and a "Create New" button. Below the search bar, a section titled "Give it a name and bind it to your application" contains a list of services. One service, "RabbitMQ for PCF", is highlighted with a green icon and a callout bubble. The service details page for "RabbitMQ for PCF" is displayed, featuring a logo, a brief description, and links to "ABOUT THIS SERVICE", "COMPANY", "Documentation", and "Support". On the left, a sidebar lists "SERVICE PLAN" options: "Production" (selected) and "free". On the right, a "CONFIGURE INSTANCE" form is open, containing fields for "Instance Name" (set to "my-rabbit"), "Add to Space" (set to "development"), and "Bind to App" (set to "pcfdemo"). At the bottom right of the form are "Cancel" and "Add" buttons.

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The screenshot shows the PCF interface with a teal circle highlighting the application card for 'pcfdemo'. An orange arrow points from the 'Bind' icon (a blue square with a white 'C') in the application card to the 'Bind' button in the configuration panel.

**APP**  
**pcfdemo**

last push: 12/16/15 @ 14:37 UTC  
<https://syo-pcfdemo.south.fe.pivot...>

**ABOUT**

BUILDPACK: java-buildpack=v3.0-offline-<https://github....>

START CMD: Set by the buildpack

STACK: cflinuxfs2 (Cloud Foundry Linux-based file...

**CONFIGURATION**

| Instances | Memory Limit | Disk Limit |
|-----------|--------------|------------|
| 1         | 512 MB       | 1 GB       |

**STATUS**

| # | STATUS  | CPU | MEMORY | DISK   | UPTIME |
|---|---------|-----|--------|--------|--------|
| 0 | Running | 0%  | 347 MB | 138 MB | 15 min |

**Scale App**

# Example: Service Creation & Binding

- Create Service
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- **Verify**

```
$ cf env pcfdemo
```

```
System-Provided:  
{  
  "VCAP_SERVICES": {  
    "p-rabbitmq": [  
      {  
        "credentials": "4ebj1iefhkq6co20g6iq6rcuko",  
        "dashboard_url": "https://pivotal-rabbitmq.south.fe.pivotal.io/#/login/f00ae186-3fdc-47b0-aaa7-0b28bbbc38a3:4ebj1iefhkq6co20g6iq6rcuko",  
        "hostname": "192.168.5.54",  
        "hostnames": [  
          "192.168.5.54"  
        ],  
        "http_api_uri": "https://f00ae186-3fdc-47b0-aaa7-0b28bbbc38a3:4ebj1iefhkq6co20g6iq6rcuko@pivotal-rabbitmq.south.fe.pivotal.io/api/",  
        "http_api_uris": [  
          "https://f00ae186-3fdc-47b0-aaa7-0b28bbbc38a3:4ebj1iefhkq6co20g6iq6rcuko@pivotal-rabbitmq.south.fe.pivotal.io/api/  
        ],  
        "password": "4ebj1iefhkq6co20g6iq6rcuko",  
        "protocols": {  
          "amqp": {  
            "host": "192.168.5.54",  
            "hosts": [  
              "192.168.5.54"  
            ],  
            "password": "4ebj1iefhkq6co20g6iq6rcuko",  
            "port": 5672,  
            "ssl": false,  
            "uri": "amqp://f00ae186-3fdc-47b0-aaa7-0b28bbbc38a3:4ebj1iefhkq6co20g6iq6rcuko@192.168.5.54:5672/amqp?ssl=false"  
          }  
        }  
      }  
    ]  
  }  
}
```

