

# Cloud Foundry Services

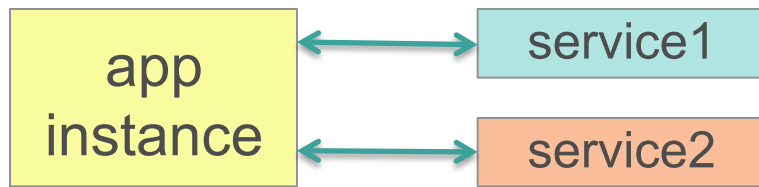
## Overview

# Topics

- **Introduction to services**
- Create and bind managed services
- Use a managed service in an application
- Create user-provided services

# Cloud Foundry Services

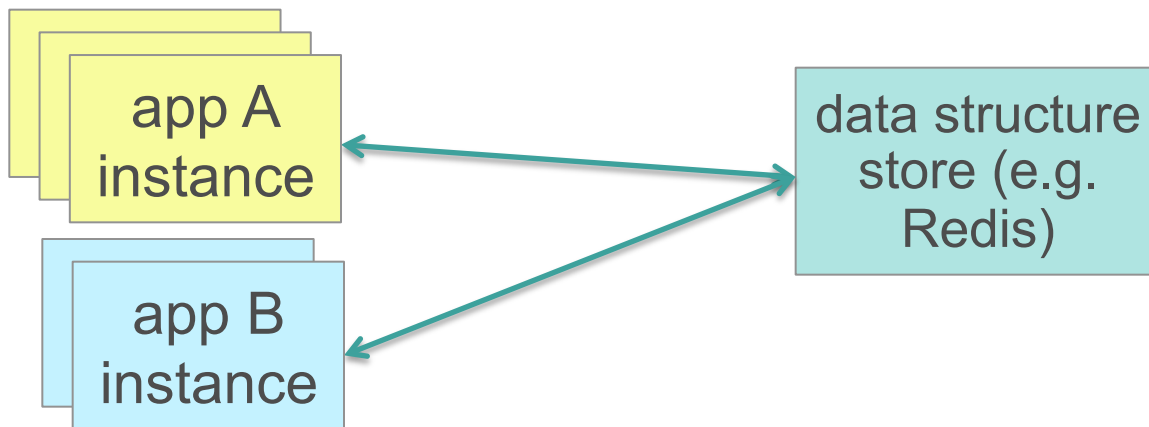
- A service is an **external** application **dependency** or **component** such as:
  - External state
    - Database, cache, message queue
  - Tools
    - Monitoring app, external logging sink, OAuth security
  - External applications
    - Microservice, web service, legacy application



*services are external  
to the app instance*

# Application State

- App instances are ephemeral (temporary)- state is not stored there
- Store state in services
  - May be *shared* among many applications and app instances



# Two Types of Services

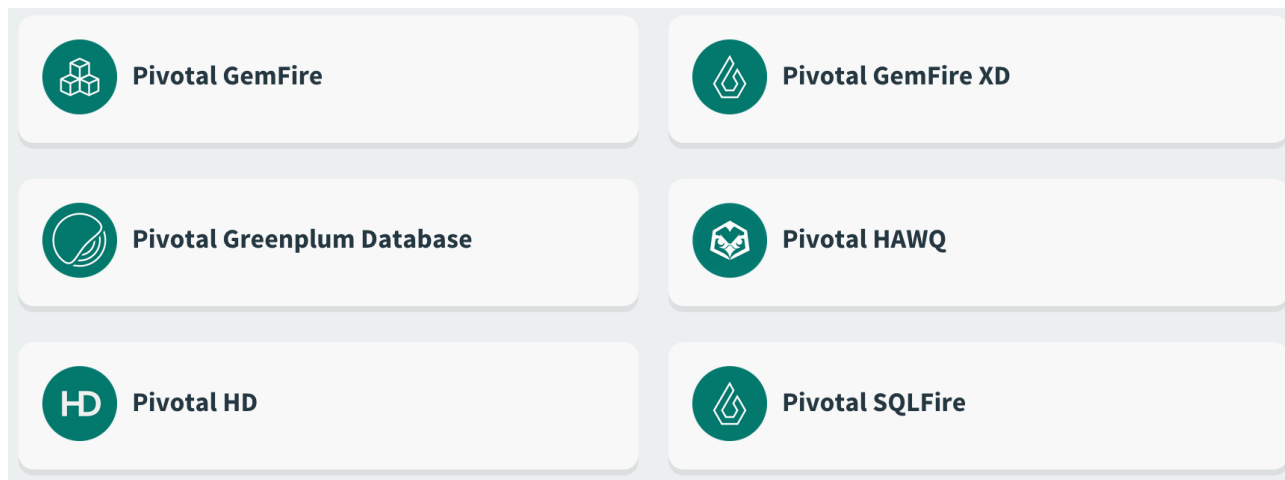
- Managed services (“*marketplace*” services)
  - Available from the marketplace 'catalog'
  - Instances are often **provisioned and managed** by the platform, for use by applications
  - The platform supplies connection information to applications
  - Can be custom created
- User provided services
  - The service is not in the marketplace
  - The platform only supplies connection information to applications

# Topics

- Introduction to services
- **Create and bind managed services**
- Use a managed service in an application
- Create user-provided services

# Installing Managed Services

- Many pre-packaged services for Pivotal Cloud Foundry
  - See <https://network.pivotal.io>
- Install using Ops Manager (an admin/operator tool)



# Pivotal Web Services (PWS)

## Marketplace Home Page in Apps Manager Console

The screenshot shows the Pivotal Web Services Marketplace Home Page. The left sidebar contains the Pivotal Web Services logo, the organization name 'sbyrnes-org', a list of spaces ('development', 'labtest', and 'Marketplace' which is highlighted with a red box), and links for Docs, Support, Tools, Blog, and Status. The main content area is titled 'Services Marketplace' and includes a sub-header 'Get started with our free marketplace services. Upgrade to gain access to premium service plans.' Below this, there is a grid of service cards: Searchify (Custom search you control), BlazeMeter (The JMeter Load Testing Cloud), Redis Cloud (Enterprise-Class Redis for Developers), ClearDB MySQL Database (Highly available MySQL for your Apps.), CloudAMQP (Managed HA RabbitMQ servers in the cloud), ElephantSQL (PostgreSQL as a Service), SendGrid, and MongoLab.

Pivotal Web Services

sbyrnes-org > Marketplace

sbyrnes@pivotal.io

ORG

sbyrnes-org

SPACES

development

labtest

Marketplace

Docs

Support

Tools

Blog

Status

### Services Marketplace

Get started with our free marketplace services. Upgrade to gain access to premium service plans.

- Searchify**  
Custom search you control
- BlazeMeter**  
The JMeter Load Testing Cloud
- Redis Cloud**  
Enterprise-Class Redis for Developers
- ClearDB MySQL Database**  
Highly available MySQL for your Apps.
- CloudAMQP**  
Managed HA RabbitMQ servers in the cloud
- ElephantSQL**  
PostgreSQL as a Service
- SendGrid**
- MongoLab**



# Finding Available Managed Services

## cf CLI

- Check the marketplace for available managed services

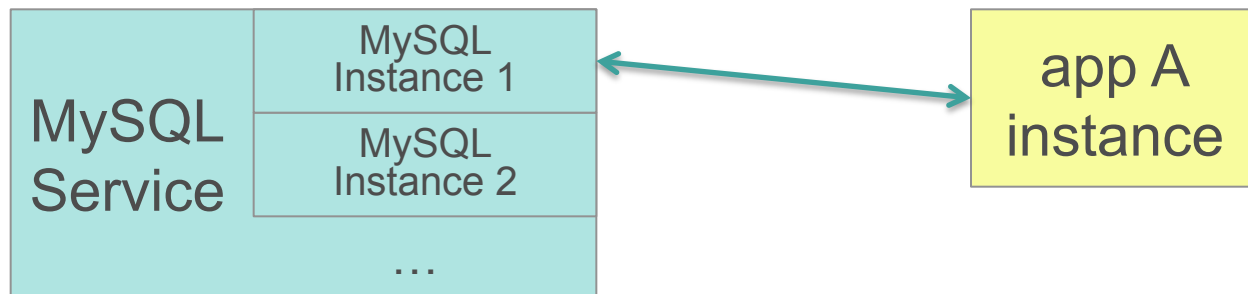
### — cf marketplace

```
files2 — bash — 157x28
greytag:files2 sbyrnes$ cf marketplace
Getting services from marketplace in org sbyrnes-org / space development as sbyrnes@pivotal.io...
OK
```

service	plans	description
3scale	free_appdirect, basic_appdirect*, pro_appdirect*	API Management Platform
blazemeter	free-tier, basic1kmr*, pro5kmr*, pp10kmr*	The JMeter Load Testing Cloud
cedexisopenmix	opx_global*, openmix-gslb-with-fusion-feeds*	Openmix Global Cloud & Data Center Load Balancer
cedexisradar	free-community-edition	Free Website& Mobile App Performance Reports
cleardb	spark, boost*, amp*, shock*	Highly available MySQL for your Apps.
cloudamqp	lemur, tiger*, bunny*, rabbit*, panda*	Managed HA RabbitMQ servers in the cloud
cloudforge	free, standard*, pro*	Development Tools In The Cloud
elephantsql	turtle, panda*, hippo*, elephant*	PostgreSQL as a Service
flashreport	trial, basic*, silver*, gold*, platinum*	Generate PDF from your data
ironmq	pro_platinum*, free, pro_gold*, large*, medium*, small*, pro_silver*	Powerful Durable Message Queueing Service
ironworker	large*, pro_gold*, pro_platinum*, pro_silver*, small*, medium*, free	Scalable Background and Async Processing
loadimpact	lifree, li100*, li500*, li1000*	Automated and on-demand performance testing
memcachedcloud	100mb*, 250mb*, 500mb*, 1gb*, 2-5gb*, 5gb*, 30mb	Enterprise-Class Memcached for Developers
memcachier	dev, 100*, 250*, 500*, 1000*, 2000*, 5000*, 7500*, 10000*, 20000*, 50000*, 100000*	The easiest, most advanced memcache.
mongodb	sandbox	Fully-managed MongoDB-as-a-Service
newrelic	standard	Manage and monitor your apps
pubnub	free	Build Realtime Apps that Scale
rediscloud	100mb*, 250mb*, 500mb*, 1gb*, 2-5gb*, 5gb*, 10gb*, 50gb*, 30mb	Enterprise-Class Redis for Developers
searchify	small*, plus*, pro*	Custom search you control
searchly	small*, micro*, professional*, advanced*, starter, business*, enterprise*	Search Made Simple. Powered-by Elasticsearch
sendgrid	free, bronze*, silver*	Email Delivery. Simplified.
stampplay	plus*, premium*, core, starter*	API-first development platform
statica	starter, spike*, micro*, medium*, large*, enterprise*, premium*	Enterprise Static IP Addresses

# Service vs. Service Instance

- **Services** can create **services instances**
- Think of the service as a template for the service instance
  - For example, a MySQL service creates “tenants” of isolated database instances
  - A service instance is one of those tenants
- App instances only see the service instances they are bound to



# Finding or Adding Service Instances- Apps Manager

Service instances are available to the **space**

The screenshot shows the Pivotal Web Services interface. On the left is a dark sidebar with the Pivotal logo and navigation links: ORG (pivotaledu), SPACES (development, production, staging, Marketplace), Docs, Support, Tools, Blog, and Status. The main header shows 'pivotaledu > development'. Below this, a 'SPACE development' badge is visible. The 'APPLICATIONS' section contains a table with one entry: 'booking-app-123' (status: STOPPED, instances: 1, memory: 1GB). The 'SERVICES' section contains a table with one entry: 'mysql' (service plan: ClearDB MySQL Database spark, bound apps: 1). A red circle highlights the 'ADD SERVICE' button in the top right of the SERVICES section.

**ORG**  
pivotaledu

**SPACES**  
development  
production  
staging  
Marketplace

Docs  
Support  
Tools  
Blog  
Status

**SPACE**  
**development**

**APPLICATIONS** [LEARN MORE](#)

STATUS	APP	INSTANCES	MEMORY
STOPPED	booking-app-123 booking-app-123.cfapp....	1	1GB

**SERVICES** [ADD SERVICE](#)

SERVICE INSTANCE	SERVICE PLAN	BOUND APPS
mysql <a href="#">Manage</a>   <a href="#">Documentation</a>   <a href="#">Support</a>   <a href="#">Delete</a>	ClearDB MySQL Database spark	1

# Finding Existing Service Instances

## cf CLI

- List existing service instances with **cf services**
  - In *current space*
  - Lists both managed and user-provided service instances
- In this example: one service instance called mydb

```
example$ cf services
Getting services in org pivotaledu / space development as user@domain...
OK
```

name	service	plan	bound-apps
mydb	cleardb	spark	booking-app-123

## Adding a Managed Service Instance to a Space (cf CLI)

- Use **cf create-service**
  - Allows selection of service and plan
- The service instance becomes available to applications in the *current space*
  - For multiple spaces, run **cf create-service** in *each* space

# Binding Service Instances to an Application

## Apps Manager

Applies to managed and user-provided service instances

The screenshot displays the Pivotal Cloud Foundry console interface. On the left, a sidebar contains navigation links for SPACES (development, labtest, Marketplace), Docs, Support, Tools, Blog, and Status. The main content area is titled 'my-php-app87' and includes a large circular logo. Below the logo, it shows the last push time and the application URL. The 'CONFIGURATION' section on the right shows 'Instances' set to 1. The 'STATUS' section shows a table with one row: 0 instances, Running status, and 0% CPU. The 'ABOUT' section lists the buildpack, start command, and stack. At the bottom, the 'BOUND SERVICES' section features a red circle around the '+ Bind a Service' button. Below this, a service instance 'my-test-mysql-db' is listed with a green checkmark and a link to 'Show credentials'.

SPACES

- development
- labtest
- Marketplace

Docs

Support

Tools

Blog

Status

APP

### my-php-app87

last push: 06/07/15 @ 22:11 UTC  
<http://my-php-app87.cfapps.io>

**CONFIGURATION**

Instances

1

**STATUS**

#	STATUS	CPU
0	Running	0%

**ABOUT**

BUILDPACK <https://github.com/cloudfoundry/php-buildpack>

START CMD Set by the buildpack

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

Events Services Env Variables Routes Logs

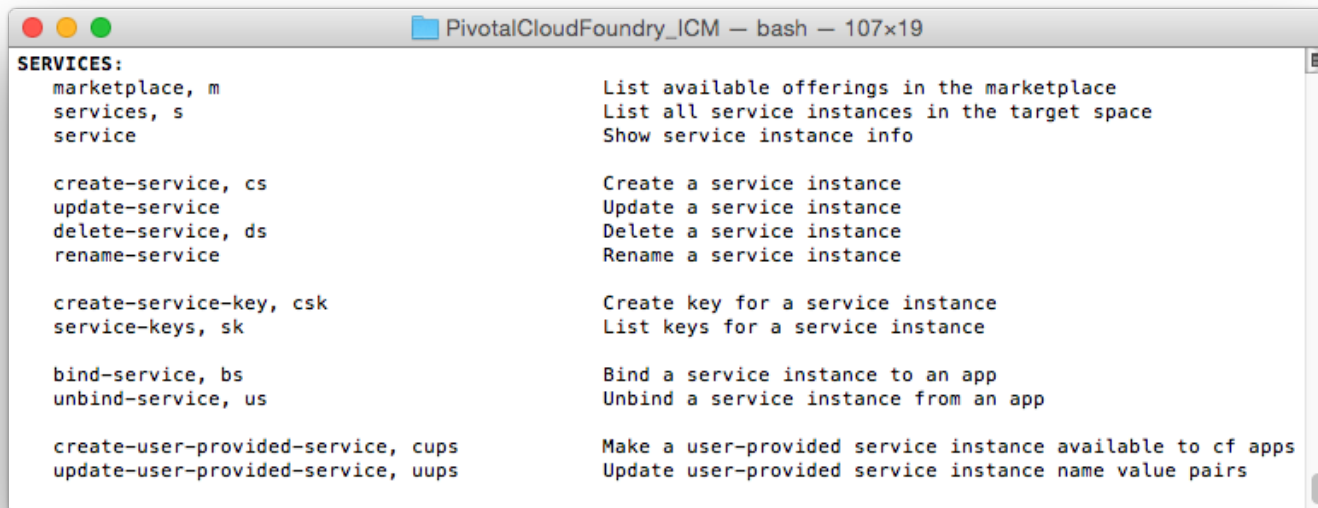
BOUND SERVICES [+ Bind a Service](#)

**my-test-mysql-db**  
ClearDB MySQL Database Spark DB  
[Show credentials](#)

# Binding Service Instances to an Application

## cf CLI

- Use **cf bind-service**
  - Applies to managed and user-provided service instances



The screenshot shows a terminal window titled "PivotalCloudFoundry\_ICM — bash — 107x19". The window displays the output of the 'cf help' command, specifically the 'SERVICES' section. The output lists various service-related commands and their descriptions. The 'bind-service' command is highlighted in the original image.

```
SERVICES:
  marketplace, m          List available offerings in the marketplace
  services, s             List all service instances in the target space
  service                 Show service instance info

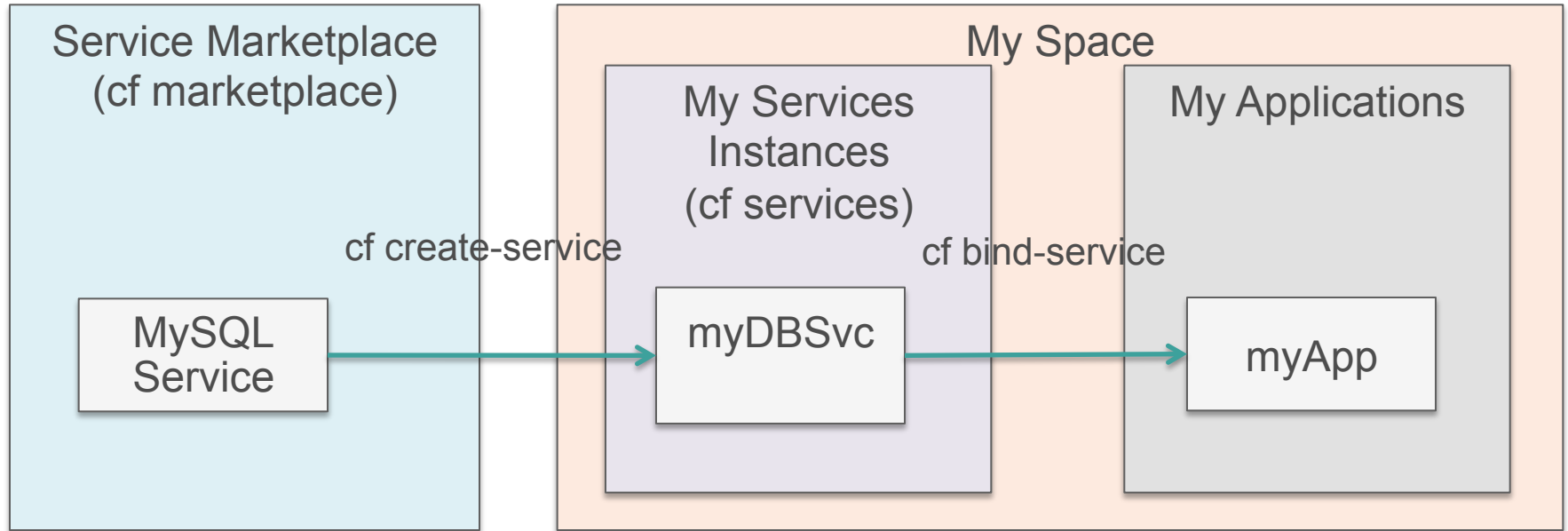
  create-service, cs      Create a service instance
  update-service          Update a service instance
  delete-service, ds     Delete a service instance
  rename-service          Rename a service instance

  create-service-key, csk Create key for a service instance
  service-keys, sk       List keys for a service instance

  bind-service, bs        Bind a service instance to an app
  unbind-service, us      Unbind a service instance from an app

  create-user-provided-service, cups Make a user-provided service instance available to cf apps
  update-user-provided-service, uups Update user-provided service instance name value pairs
```

# Managed Services, Service Instances and Applications





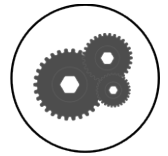
# Binding Service Instances to an Application

## Application Manifest

- You can use the **services** section of the application manifest to bind a service instance to an application with **cf push**
  - Applies to managed and user-provided service instances

```
---
applications:
- name: myapp
  memory: 128M
  services:
    - myservice
```

# Example: Creating and Binding a Postgres Service



```
example$ cf services
Getting services in org pivotaledu / space development as user@domain...
OK
name          service      plan      bound-apps
(no services)

example$ cf create-service elephantsql turtle mypg
Creating service mypg in org pivotaledu / space development as user@domain...
OK

example$ cf services
Getting services in org pivotaledu / space development as user@domain...
OK
name          service      plan      bound-apps
mypg          elephantsql  turtle

example$ cf bind-service booking-app-456 mypg
Binding service mypg to booking-app-456 in org pivotaledu / space development as
user@domain...
OK
TIP Use 'cf restage' to ensure your env variable changes take effect
```

# Topics

- Introduction to services
- Create and bind managed services
- **Use a managed service in an application**
- Create user-provided services

# Using a Managed Service – Developer View

- Create a service instance for the space (if necessary)
- Bind it to your application
- Modify your application to read configuration information via environment variables (if necessary)

DEVELOPER

*cf create-service <myService>*

*cf bind-service <myApp> <myService>*


# Accessing Connection Information (1 of 2)

- The platform creates user accounts and passwords for service instances
  - No need to hard-code any connection information
- After binding a service instance, connection information is available to applications in environment variables:  
**VCAP\_SERVICES**
- Once the application is *staged*, view connection information using
  - `cf env [app-name]`
  - Look for **VCAP\_SERVICES** in the output

# Accessing Connection Information (2 of 2)

Connection information also available via Apps Manager:

**BOUND SERVICES**[+ Bind a Service](#)

**mydb**

ClearDB MySQL Database Spark DB

▼ Hide credentials

[Manage](#)[Support](#)[Docs](#)

Unbind

JDBCURL	<code>jdbc:mysql://b4eb8a837a231d:c3b28eec@us-cdbr-east-06.cleardb.net:3306/ad_d691ab771b6397e</code>
URI	<code>mysql://b4eb8a837a231d:c3b28eec@us-cdbr-east-06.cleardb.net:3306/ad_d691ab771b6397e?reco</code>
NAME	<code>ad_d691ab771b6397e</code>
HOSTNAME	<code>us-cdbr-east-06.cleardb.net</code>
PORT	<code>3306</code>
USERNAME	<code>b4eb8a837a231d</code>
PASSWORD	<code>c3b28eec</code>

[View JSON](#)

# VCAP\_SERVICES Property

```
VCAP_SERVICES=
```

```
{  
  cleardb-n/a: [  
    {  
      name: "cleardb-1",  
      label: "cleardb-n/a",  
      plan: "spark",  
      credentials: {  
        name: "ad_c6f4446532610ab",  
        hostname: "us-cdbr-east-03.cleardb.com",  
        port: "3306",  
        username: "b5d435f40dd2b2",  
        password: "ebfc00ac",  
        uri: "mysql://b5d435f40dd2b2:ebfc00ac@us-cdbr-east-  
              03.cleardb.com:3306/ad_c6f4446532610ab",  
        jdbcUrl: "jdbc:mysql://b5d435f40dd2b2:ebfc00ac@us-  
                  cdbr-east-03.cleardb.com:3306/ad_c6f4446532610ab"  
      }  
    }  
  ]  
  ...  
}
```

Just a very long string in  
JSON format

Parse to extract  
credentials

# Topics

- Introduction to services
- Create and bind managed services
- Use a managed service in an application
- **Create user-provided services**



# User Provided Service Instances

- Typically represent external assets like legacy databases
- Behave like other service instances once created
- When bound, they provide service instance credentials and other configuration information to applications
  - Avoids hard coding service instance endpoints

<http://docs.pivotal.io/pivotalcf/devguide/services/user-provided.html>

# Creating User Provided Service Instances

- Use `cf create-user-provided-service` or `cf cups`
  - Provide name and parameters/credentials
  - All applications bound to *same* instance in *same* way
- The service will be listed in `cf services` for the target space and is available for binding to applications

```
$ cf cups mydb -p "hostname, port, username, password, name"
hostname> db.example.com
port> 1234
username> dbuser
password> dbpasswd
name> mydb
Creating user provided service mydb ... OK
```

specify *any* list of parameters here

prompts for parameter values

# Binding User-Provided Service Instances to an Application

## Apps Manager

Applies to managed and user-provided service instances

The screenshot displays the Pivotal RunPivotal console interface for an application named 'my-php-app87'. The interface is divided into several sections:

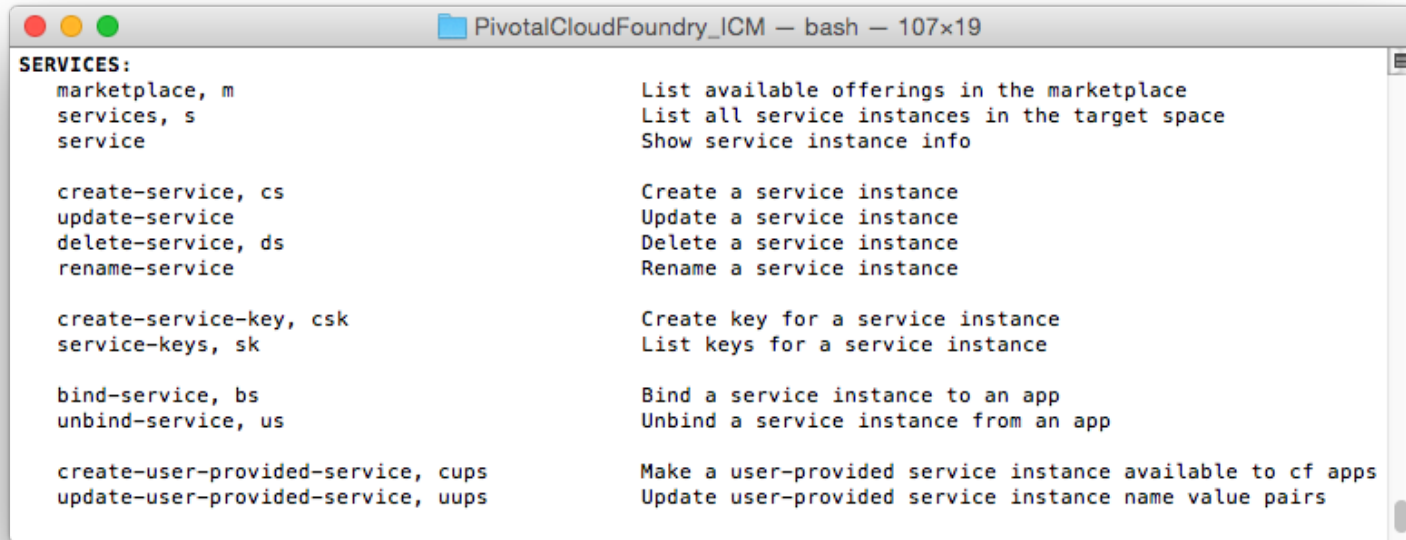
- SPACES:** A sidebar on the left lists 'development' (selected), 'labtest', and 'Marketplace'. Below this are links for 'Docs', 'Support', 'Tools', 'Blog', and 'Status'.
- APP:** A central card for 'my-php-app87' showing a 'last push' of '06/07/15 @ 22:11 UTC' and a link to 'http://my-php-app87.cfapps.io'.
- CONFIGURATION:** A section on the right showing 'Instances' set to '1'.
- STATUS:** A table showing the application's status:

#	STATUS	CPU
0	Running	0%

Below the status table, there are tabs for 'Events', 'Services' (selected), 'Env Variables', 'Routes', and 'Logs'. Under the 'Services' tab, there is a 'BOUND SERVICES' section with a red circle highlighting a '+ Bind a Service' button. Below this, a service named 'my-test-mysql-db' is listed, identified as a 'ClearDB MySQL Database Spark DB', with a 'Show credentials' link.

# Binding User-Provided Service Instances to an Application cf CLI

- Use *cf bind-service*
  - Applies to managed and user-provided service instances



```
PivotalCloudFoundry_ICM — bash — 107x19

SERVICES:
  marketplace, m      List available offerings in the marketplace
  services, s         List all service instances in the target space
  service             Show service instance info

  create-service, cs   Create a service instance
  update-service       Update a service instance
  delete-service, ds   Delete a service instance
  rename-service       Rename a service instance

  create-service-key, csk Create key for a service instance
  service-keys, sk     List keys for a service instance

  bind-service, bs     Bind a service instance to an app
  unbind-service, us   Unbind a service instance from an app

  create-user-provided-service, cups Make a user-provided service instance available to cf apps
  update-user-provided-service, uups Update user-provided service instance name value pairs
```

# User Provided Services - Accessing

- Bound service properties available in **VCAP\_SERVICES** environment variable
- In your code
  - Access variable
  - Parse JSON
  - Use to connect

```
{
  user-provided: [
    {
      name: "mydb",
      label: "user-provided",
      tags: [ ],
      credentials: {
        hostname: "db.example.com",
        port: "1234",
        username: "dbuser",
        password: "dbpasswd",
        name: "mydb"
      }
    }
  ]
}
```

# Topics

- Introduction to services
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# Lab

Create a managed service instance  
and bind to it