

A background image showing a close-up of two people in business attire sitting at a table. One person is holding a pen and pointing at a document with a pie chart, while the other is writing on a clipboard. The image is slightly blurred, focusing on the hands and documents.

Cloud Foundry - Services

Objectives of CF - Services

- Purpose:
 - To learn pivotal cloud foundry services.
- Product:
 - Managed Services
 - Pivotal CF Services
 - PWS and App Direct Services
 - Creating and Binding Services
- Process:
 - To learn and deploy a service.

Table of Contents

- Managed (Marketplace) Services
- Pivotal CF standard Services
- PWS and App Direct Services
- Creating and Binding Services
 - Provisioning Service
 - Using the CLI
 - Using the Pivotal CF App Manager Console
 - Binding to a Service
 - User Provided Services

MANAGED (MARKETPLACE) SERVICES

What is a Service?

- Service is an external application dependency or component such as
 - Database
 - Message Queue
 - Monitoring App
 - Security
 - Hadoop instance
 - Generic Service Endpoint (Web Services)
 - Other dependent applications

Features and Functionality

- Provide functionality to our applications
- External to our applications
 - Add-on provisioned alongside an application.
- May be shared among many applications
 - Example – Relational DB, Messaging system
- Are bound to (associated with) an application
 - Using a “Service Broker”
- Provide connection information to application via environment variables
 - **VCAP_SERVICES**

Why use a service?

- Applications are the deployment unit
 - Must be self-contained
- Anything else they need is provided by the PaaS
 - By a service
- Services in a PaaS are
 - One of the main possible charging units / elements
 - Instead of hardware resources like an IaaS
 - Make commercial PaaS possible
 - Enable charge-back in your organization

Two Types of Services

■ Managed Services (a.k.a. “Marketplace” Services)

- Available ‘out-of-the-box’
- Selected from marketplace ‘catalog’
- Instances provisioned by PaaS, for use by application

CF Managed

■ User Defined Services

- Services running external to Cloud Foundry
- Connection information stored and used to connect
- PaaS does not provision resources, only supplies connection information.

User Managed

Custom services

Also CF Managed

■ Custom Built Services

- Custom service created and installed into Cloud Foundry
 - Looks like any other managed service once added
 - Appears in the Marketplace
- Alternative to user-defined services
 - Full integration with CF

■ Requirements

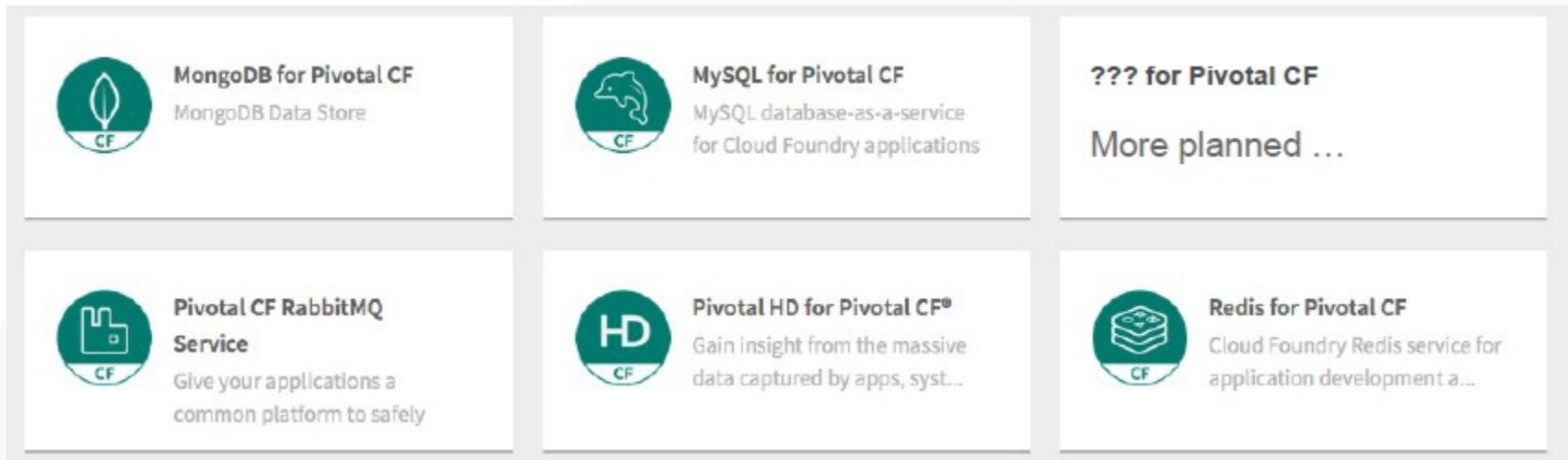
- Custom development of *service broker*
- And *operator* installation into Cloud Foundry

Accessing External Services

- Typically these exist already
 - Your ERP and CRM systems (Oracle, SAP ...)
 - Mainframe developed/running in-house
 - Cloud-based services such as sales, CRM or payroll
- Two options
 - User-defined service
 - Our ops people continue to manage and provision
 - Custom Service
 - CF uses service-broker to provision and bind

Accessing Managed Services

- Easily available via Marketplace
 - Allow us to sign-up, select plans, etc
 - Once bound to application, can be used easily
- Many pre-packaged services for Pivotal CF
 - See <https://network.pivotal.io/products>



Managed Services

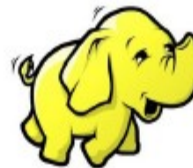
- Services preconfigured and made available to Cloud Foundry
 - Typically by operations personnel
- On-premise/private cloud
 - Our company controls what is available
 - Services typically run in our data-centre
- Public cloud
 - Cloud provided controlled
 - Services may run anywhere – locality considerations



PIVOTAL CF SERVICES

What Services are Available

- Whatever our company chooses
 - Services added after Pivotal CF installation by Ops
 - Available as .pivotal files from Pivotal Network
 - See <https://network.pivotal.io>
- The section discusses several services
 - They may not be available to your private cloud



SQL Databases - MYSQL



- Free, Open Source Relational Database
 - GPL licensing
 - High-Available, clustered, synchronously replicated using MariaDB Galera Cluster
 - Each node has a copy of each DB
 - Writes to any DB are replicated to all copies
 - Client connections routed to primary, on failure proxy routes to a healthy node
 - Suitable for production use



NoSQL Data Services



MongoDB for Pivotal CF
MongoDB Data Store



Neo4j for Pivotal CF
Neo4j Graph Database



Riak CS for Pivotal CF
An S3-compatible object store
for Cloud Foundry applications



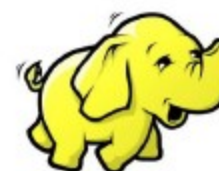
Redis for Pivotal CF
Redis for Pivotal CF service for
application development and
testing.

- MongoDB – Popular Document store
- Neo4j – Graph Database
- Riak CS – “Cloud Store” for accessing Amazon S3-like file storage
- Redis – Popular Key / Value store from Pivotal

- Available Soon: Elasticsearch, Memcached , Gemfire, DataStax (Cassandra)
- *Not intended* for production use



- Directly from Pivotal CF, provision Hadoop resources to power data-centric Cloud Foundry Apps
 - HDFS, Map-Reduce, Hive, Hbase, YARN, Zookeeper ..
 - Or connect to existing Hadoop cluster
 - HAWQ: Pivotal's fast, distributed SQL engine
 - Perform deep, complex analytics in SQL (or R, Madlib, etc)
 - Run Hadoop jobs directly from Pivotal CF application
- Runtime service broker integration
 - Instant credential generation & binding to shared PHD cluster





- Single HA cluster deployment of RabbitMQ
 - Runtime service broker integration
 - Instant credential generation, binding to shared RMQ cluster
 - Unique virtual host per binding
 - Is intended for production use

PWS AND APPS DIRECT

- Public Cloud Foundry instance
 - Hosted on AWS
 - Provides extensive marketplace of services via App Direct
 - Some free
 - Some pay-per use
 - Examples
 - Postgres DB, MYSQL, MongoDB, Redis
 - Rabbit MQ
 - Blazemeter monitoring
 - Many, many more ...

Marketplace Home Page in App Manager Console

The screenshot displays the Pivotal Web Services Marketplace interface. On the left, a dark sidebar contains navigation links: ORG (krueger-net), SPACES (development, production, QA, staging, Marketplace), 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, eight service tiles are arranged in a 4x2 grid:

- BlazeMeter**: The JMeter Load Testing Cloud (Icon: Yellow stylized 'B' on a black square).
- ClearDB MySQL Database**: Highly available MySQL for your Apps. (Icon: Purple database cylinders with a green checkmark).
- CloudAMQP**: Managed HA RabbitMQ servers in the cloud (Icon: White rabbit).
- CloudForge**: Development Tools In The Cloud (Icon: Blue cloud with a circular arrow).
- ElephantSQL**: PostgreSQL as a Service (Icon: Grey elephant).
- IronMQ**: Powerful Durable Message Queueing Service (Icon: Blue square with a white arrow).
- IronWorker**: Scalable Background and Async Processing (Icon: Blue gear).
- Load Impact**: Automated and on-demand performance testing (Icon: Green eye-like shape).

The top of the interface shows the Pivotal Web Services logo, the breadcrumb 'krueger-net > Marketplace', and the user email 'kkrueger@gopivotal.com'.

- Commercial provider of services
 - Provide third-party service market
 - Teamed up with well-known providers, like Redis Labs
 - Various plans and fees
 - The provider of services offered by PWS
 - Our company may choose to use App-Direct as well
- Services run by providers
 - For example a Redis instance would run at Redis Labs
 - External to our data-centre
 - Locality issues: performance, connectivity, security, legal

PWS Cloud – Foundry Services

- Marketplace services in PWS offered via App-Direct



<http://www.appdirect.com>

Running Cloud Foundry On Premise



- All services typically run in our data-centre
 - Many may already exist
 - Databases, message-brokers, mail servers ...
 - CF ops decide what services to install and/or make available to applications
- Our company may choose to use third-party services
 - For services it does not wish to manage
 - Cloud-based services such as sales, CRM, payroll
 - And/or a Commercial provider like AppDirect

Using a Public Service



- Services provided for us by our cloud provider
 - For example PWS
 - We have little control over what services are offered
 - Services may not be hosted by cloud provider
- Considerations around service location
 - Network reliability
 - Legal jurisdiction of host servers
 - Security

CREATING AND BINDING SERVICES

Provisioning Services → Service Vs. Service Instance

- Services provision services instances
 - For example
 - ClearDB service provisions MySQL databases.
 - Offers different plans (fees, SLAs)
 - We may get a dedicated server, or share a multi-tenant server

Provisioning – Operator View

- Available services depend on CF setup
 - Must be installed and configured by CF Ops
 - Either via Pivotal CF Operator's Console (*Ops Manager*)
 - Using **cf** CLI
 - Or using the BOSH provisioning tool
- Once Ops have deployed a service to your CF instance
 - It appears in the **marketplace**
 - Can be made available to our application = **provisioning**

OPERATOR

cf create-service-broker

cf enable-service-access

Service “Tiles” in PCF Ops Manager

OPERATOR

Only installed services appear in the “marketplace”

The screenshot shows the PCF Ops Manager interface. On the left, a sidebar lists 'Available Products' with links to 'Ops Manager Director', 'Pivotal Elastic Runtime', 'Jenkins Enterprise by CloudBees for Pivotal CF', 'MySQL for Pivotal Cloud Foundry', and 'Pivotal Ops Metrics', each with a 'No upgrades available' status. The main area is the 'Installation Dashboard' showing five service tiles. Each tile includes a logo, the service name, and its version. The tiles are: 'Ops Manager Director for vmware vSphere' (v1.4.0.0), 'Pivotal Elastic Runtime' (v1.4.0.0), 'Jenkins Enterprise by CloudBees for Pivotal CF' (v1.3.8.3), 'MySQL for Pivotal Cloud Foundry' (v1.5.0.0), and 'Pivotal Ops Metrics' (v1.4.0.0). On the right, there is a 'No updates' status, an 'Apply changes' button, and a 'Recent Install Logs' link. A red callout box with arrows pointing to the 'Jenkins Enterprise' and 'MySQL for Pivotal Cloud Foundry' tiles contains the text: 'Operations staff import service “tiles”, configure them and **Apply Changes** to install.'

Provisioning – Developer View

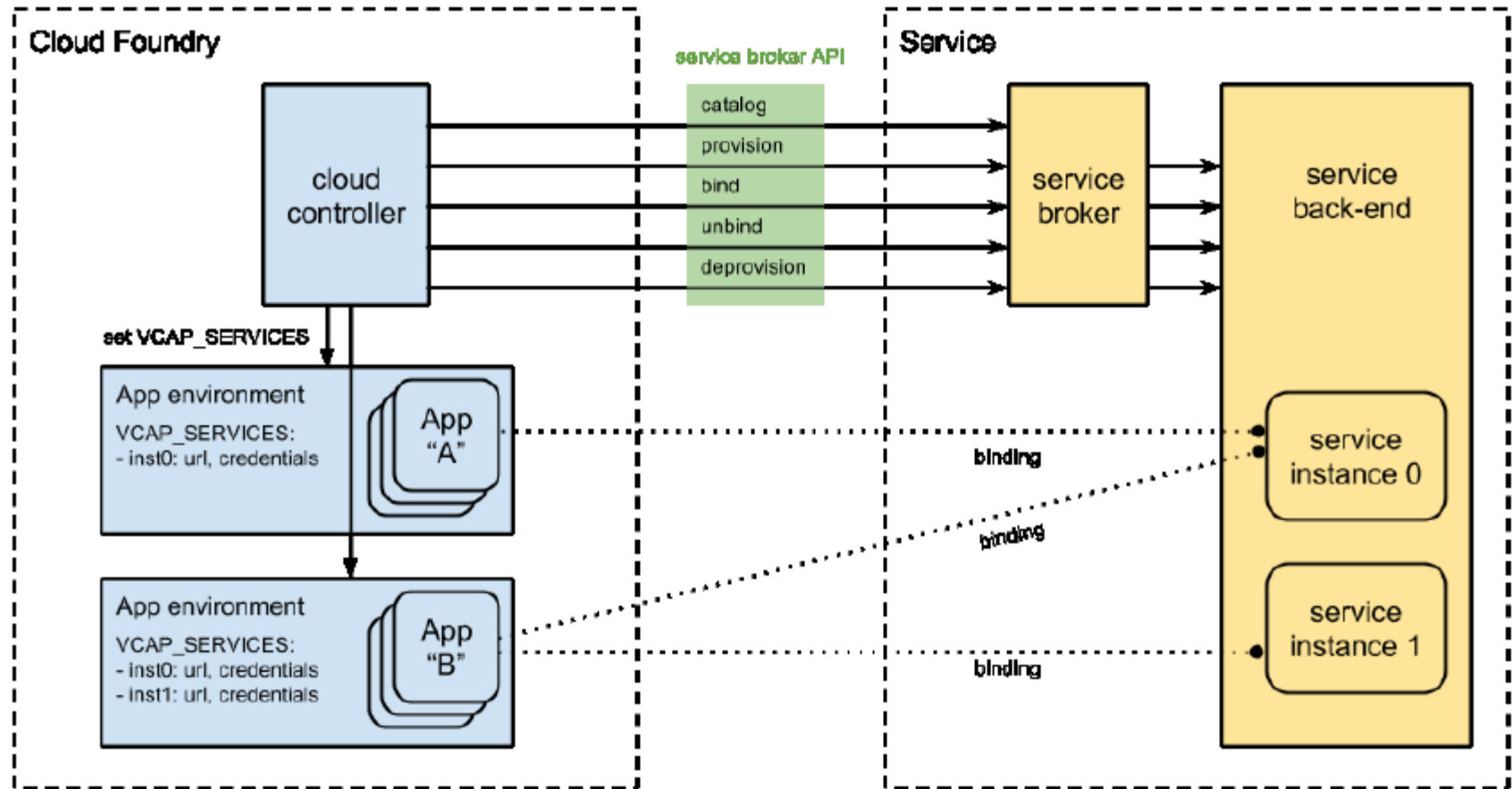
- Only concerned with what a developer has to do
 - Create (provision) a service
 - Bind it to your application

DEVELOPER

cf create <myService>

cf bind <myApp> <myService>

Services Overview – Service Brokers



Creating a Service Instance

- Actually we are Provisioning an instance of a service
 - It must already exist in CF marketplace
- Use App Manager or **cf create-service**
 - Allows selection of service and plan
- Service instance becomes available to current space
 - And any applications running in it
 - For multiple spaces, run **create-service** in each space

Using the CLI

Finding Available Services (*Command Line Interface*)

- Check marketplace for available services
 - Essentially a service catalog

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

service	plans	description
blazemeter	free-tier, basic1kmr, pro5kmr, pp10kmr, hv40kmr	The JMeter Load Testing Cloud
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
ironmq	pro_platinum, pro_gold, large, medium, small, pro_silver	Powerful Durable Message Queueing Service
ironworker	large, pro_gold, pro_platinum, pro_silver, small, medium	Scalable Background and Async Processing
...		

Finding Existing Service Instances

(*Command Line Interface*)

- List existing services instance
 - In current space
- In this example: one service instance called mysql

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

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

- Remember, to change spaces
 - **cf target -s [space-name]**

Provisioning a new Service Instance

(*Command Line Interface*)

- Provision a new service instance
 - Added to current space
 - Give it a name
 - Choose the correct plan or contract
- Usage
 - **cf create-service [service-name] [plan-name] [instance-name]**

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

Finding Existing Service Instances

(*Command Line Interfaces*)

- List service instances again for current space
 - New service instance now appears

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
mypg	elephantsql	turtle	

Service created

Using the Pivotal CF App Manager Console

Provisioning Service Instances

GUI

The screenshot displays the Pivotal Web Services interface. On the left is a dark sidebar with the Pivotal logo and 'Web Services' text. Below this, it lists 'ORG' as 'pivotaledu' and 'SPACES' as 'development', 'production', and 'staging'. At the bottom of the sidebar are links for 'Docs', 'Support', 'Tools', 'Blog', and 'Status'. An orange arrow labeled 'Marketplace' points to the 'Marketplace' link in the sidebar. The main content area shows the 'development' space. It has a header 'SPACE development'. Below this, there are two sections: 'APPLICATIONS' and 'SERVICES'. The 'APPLICATIONS' section has a 'LEARN MORE' link and a table with columns 'STATUS', 'APP', 'INSTANCES', and 'MEMORY'. It shows one application 'booking-app-123' with a 'STOPPED' status, 1 instance, and 1GB memory. The 'SERVICES' section has an 'ADD SERVICE' link and a table with columns 'SERVICE INSTANCE', 'SERVICE PLAN', and 'BOUND APPS'. It shows one service instance 'ClearDB MySQL Database spark' with 1 bound app. An orange arrow labeled 'Services' points to the 'SERVICES' section.

Pivotal Web Services

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
Manage Documentation Support Delete	ClearDB MySQL Database spark	1

Finding Available Services – (Service Selection)

The screenshot displays the Pivotal Web Services Marketplace interface. On the left is a dark sidebar with navigation links: 'Pivotal Web Services', 'ORG' (pivotaledu), 'SPACES' (development, production, staging, Marketplace), and 'Docs', 'Support', 'Tools', 'Blog', 'Status'. The main content area is titled 'Services Marketplace' with a subtitle 'Get started with our free marketplace services. Upgrade to gain access to premium service plans.' It features a grid of service cards: BlazeMeter (The JMeter Load Testing Cloud), ClearDB MySQL Database (Highly available MySQL for your Apps.), CloudAMQP (Managed HA RabbitMQ servers in the cloud), CloudForge (Development Tools In The Cloud), ElephantSQL (PostgreSQL as a Service), IronMQ (Powerful Durable Message Queuing Service), IronWorker (Scalable Background and Async Processing), and Impact (Cloud and on-demand performance testing). A blue button labeled 'VIEW PLAN OPTIONS' is positioned below the ElephantSQL card. An orange callout box with the text 'Choose to check available plans' points towards the bottom right of the service grid.

Provisioning a new Service Instance – (*Pick a Plan*)

Pivotal Web Services

[pivotal.edu](#) > [Marketplace](#) > [ElephantSQL](#)

ElephantSQL
PostgreSQL as a Service

ABOUT THIS SERVICE
The most advanced open-source database, hosted in the cloud.
[Documentation](#) | [Support](#)

SERVICE PLANS

Tiny Turtle	free
Pretty Panda	\$19.00/MONTH
Happy Hippo	\$99.00/MONTH
Enormous Elephant	\$499.00/MONTH

PLAN FEATURES

- Shared high performance cluster
- 20 MB data
- 4 concurrent connections

SELECT THIS PLAN

Choose the plan

Provisioning a new Service Instance – (*Provision (create) service*)

The screenshot shows the Pivotal Web Services interface for provisioning a new ElephantSQL service instance. The left sidebar contains navigation links: Pivotal Web Services, ORG (pivotaledu), SPACES (development, production, staging, Marketplace), Docs, Support, Tools, Blog, and Status. The main content area is titled 'pivotaledu > Marketplace > ElephantSQL > Add a new Service Instan...'. It features the ElephantSQL logo and the text 'PostgreSQL as a Service'. The 'ABOUT THIS SERVICE' section describes it as 'The most advanced open-source database, hosted in the cloud.' and provides links for 'Documentation' and 'Support'. The 'COMPANY' section lists '84codes AB'. The 'SERVICE PLAN' section shows 'Tiny Turtle' and 'free'. The 'CONFIGURE INSTANCE' section includes fields for 'Instance Name' (mypg), 'Add to Space' (development), and 'Bind to App' ([do not bind]). The 'SUBSCRIPTION TERMS' section lists four terms: a monthly subscription charge, the ability to cancel a service subscription by deleting the instance, no credits for unused portions, and monthly billing starting today. At the bottom are 'CANCEL' and 'ADD' buttons. Two orange callout boxes are present: one pointing to the 'Instance Name' field with the text 'Specify instance name', and another pointing to the 'ADD' button with the text 'Create the service'.

Pivotal Web Services

pivotaledu > Marketplace > ElephantSQL > Add a new Service Instan...

ElephantSQL
PostgreSQL as a Service

ABOUT THIS SERVICE
The most advanced open-source database, hosted in the cloud.
[Documentation](#) | [Support](#)

COMPANY
84codes AB

SERVICE PLAN
Tiny Turtle free

CONFIGURE INSTANCE

Instance Name: mypg

Add to Space: development

Bind to App: [do not bind]

SUBSCRIPTION TERMS

- A monthly subscription charge is added to the bill at the start of every monthly service period.
- Cancel a service subscription by deleting the instance.
- Credits are not issued for the unused portion of a monthly subscription period.
- Your subscription will be billed monthly starting today.

CANCEL ADD

Specify instance name

Create the service

Provisioning a new Service Instance – (Complete)

Pivotal Web Services `pivotaledu > development`

Service instance mypg created.

Success

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
Manage Documentation Support Delete	ClearDB MySQL Database spark	1
Manage Documentation Support Delete	ElephantSQL turtle	0

Service available

Binding to a Service

Accessing Service Instances from an App?

(Traditional way)

- Traditionally, for an application to access a service instance, connection properties are required
- For example: a database instance
 - Need to know service address / port, credentials
 - Such as a JDBC connection
- May be hard-coded, provided through the environment or a configuration file
- Typically service-specific code is required

Accessing Service Instances from an App?

(*Traditional way*)

- Configuration files

```
development:
  adapter: mysql2
  encoding: utf8
  database: pivotaldb
  username: pivotal
  password: pivotal
  host: myDbHost
  port: 3306
```

Ruby

```
datasource {
  driverClassName = "com.mysql.jdbc.Driver"
  username = "pivotal"
  password = "pivotal"
  url = "jdbc:mysql://myDbHost:3306/pivotaldb"
}
```

Groovy

```
datasource.driverClassName="com.mysql.jdbc.Driver"
datasource.username="pivotal"
datasource.password="pivotal"
datasource.url="jdbc:mysql://myDbHost:3306/pivotaldb"
```

Java

Accessing Service Instances from an App?

(The CloudFoundry way)

- In CloudFoundry, you bind the service instance to apps
 - Connection credentials are negotiated / defined for you
 - Application code only needs service name and type/kind
 - Example: a Postgres instance with name “my`pg`”
 - Service details injected into application by CF
 - VCAP_SERVICES
 - Any changes (host/port/credentials) are managed external to the application.

Example 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"  
      }  
    }  
  ]  
  ...  
}
```

ClearDB is the MySQL instance
offered through App Direct

Using a Service – Cloud Foundry

(*Binding using the CLI*)

- Binding associates an application to a service instance.
 - Use **cf bind-service**
 - Syntax
 - **cf bind-service [app_name] [service_name]**

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

Using a Service – Cloud Foundry

(*Binding using a Manifest*)

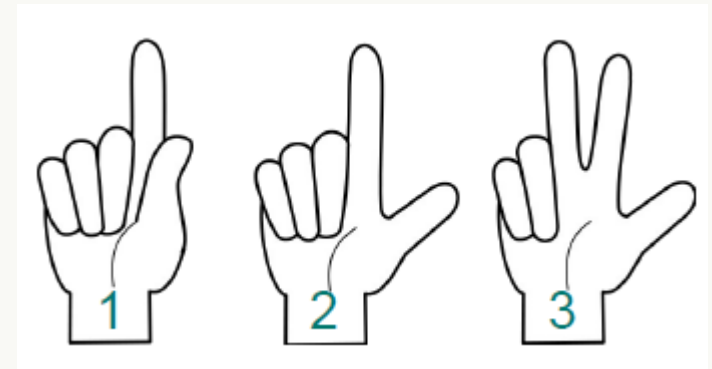
- Add a services section to our application in the manifest
 - Example manifest.yml

```
---
applications:
- name: booking-app-456
  memory: 256M
  instances: 2
  host: booking-app-456
  domain: cfapps.io
  path: target/booking-app.war
  # services, one per line
  services:
  - mypg
  - mydb
```

Using a Service – (*The CloudFoundry way*)



- Cloud Foundry provides application with VCAP_SERVICES environment variable
 - Which contains connection details / credentials in JSON.
- How can an application obtain the credentials?
- Three options:
 - Manual
 - Explicit low-level code
 - Custom library
 - Explicit code, higher level interface
 - Auto Configuration
 - CF does it for you



Using a Service – (*Application View*)

1. Manually



- Manual configuration
 - Access VCAP_SERVICES environment variable
 - In our code, parse the JSON (see next slide)
- Very low-level but works in most languages
 - Fall-back option when options 2 and 3 aren't possible

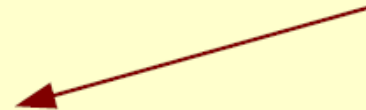
Recall: VCAP_SERVICES Property

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 these credentials



Using a Service – (Application View)

2. Custom Library



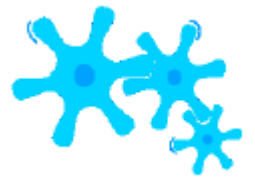
- Avoid manual parsing using a cloud-aware library
 - Cloud foundry aware helper code
 - Language/framework dependent
 - Parses **VCAP_SERVICES** for us
 - JVM: use Spring Cloud project
 - Node.js: use *cfruntime* object

Derived from
VCAP_SERVICES

```
for (ServiceInfo service : cloud.getServiceInfos() ) {  
    if (service instanceof MysqlServiceInfo)  
        connectionURI = ((MysqlServiceInfo)service).getJdbcUri();  
} ...
```

Java Example

3. Auto Configuration



- Cloud Foundry creates the service connection for us
 - Not always supported, depends on:
 1. The buildpack
 - Some buildpacks support auto-configuration, others do not.
 2. The framework
 - Spring, grails, Lift, Rails currently supported.
 3. The uniqueness of the service type
 - For example, can auto-configure ONE database connection
- CF doesn't know which is which if there are two or more

Accessing Connection Information

■ Recall

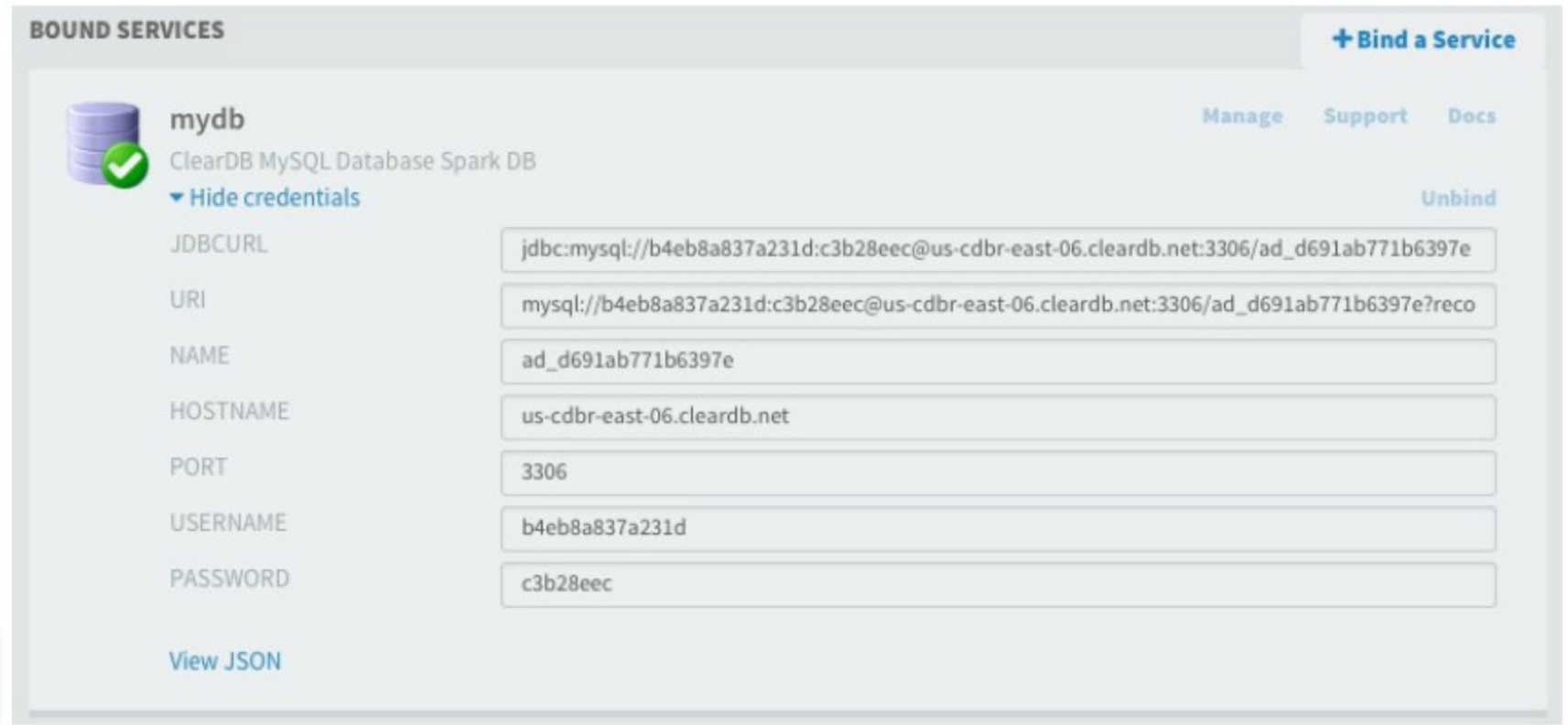
- Connection information once bound is in **VCAP_SERVICES**
- Every application's environment is logged at startup

■ Once application is staged, view connection information using

- `cf env [app-name]`
- Look for **VCAP_SERVICES** in the output

Accessing Connection Information -2

- Connection information also available via App manager:



The screenshot displays the 'BOUND SERVICES' section of an application manager. A service named 'mydb' is listed, identified as a 'ClearDB MySQL Database Spark DB'. It includes a 'Hide credentials' toggle and an 'Unbind' link. Below this, a table of connection parameters is shown:

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

At the bottom left of the service card, there is a 'View JSON' link. At the top right of the 'BOUND SERVICES' header, there is a '+ Bind a Service' button. To the right of the service name, there are links for 'Manage', 'Support', and 'Docs'.

User Provided Services

User Provided Service Instances

- User-provided service instances are service instances
 - Already provisioned outside of **Cloud Foundry**
 - Behave like other service instances once created
 - Are little more than predefined configurations
 - A “mock” service for providing credentials
- When bound they provide service instance configuration (including credentials) to applications
 - Avoids hard coding service instance endpoints

<http://docs.cloudfoundry.org/devguide/services/user-provided.html>

Use Cases

User Provided Service Instances

- These are typically legacy or existing instances of a service (databases, queues, email, etc)
 - Applications connect to the same instance
 - With CF services, applications get different instances
 - Typically used with CF on-premise
 - Easy integration of your CF PaaS with our existing systems
- Credentials passing used to inject the same credential set into each applicaiton

Defining User Provided Services - 1

- Use **cf create-user-provided-service** command
 - Provide name and parameters/credentials
 - All applications bound to same instance in same way

```
$ 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
```

Or use alias: **cf cups**

Specify *any* list of parameters here

Prompts for parameters values

Defining User Provided Services - 2

- Or define within application's manifest.yml

```
---
applications:
- name: spring-music
  memory: 512M
  instances: 1
  host: spring-music
  domain: cfapps.io
  path: build/libs/spring-music.war
  services:
    mydb:
      label: user-provided
      credentials:
        uri: postgres://dbuser:dbpass@db.example.com:1234/dbname
        username: pivotal
        password: pivotal
```

User Provided Services - Accessing

- Bound service properties available in **VCAP_SERVICES** environment variable
- In our code
 - Access variable
 - Parse JSON
 - Use to connect

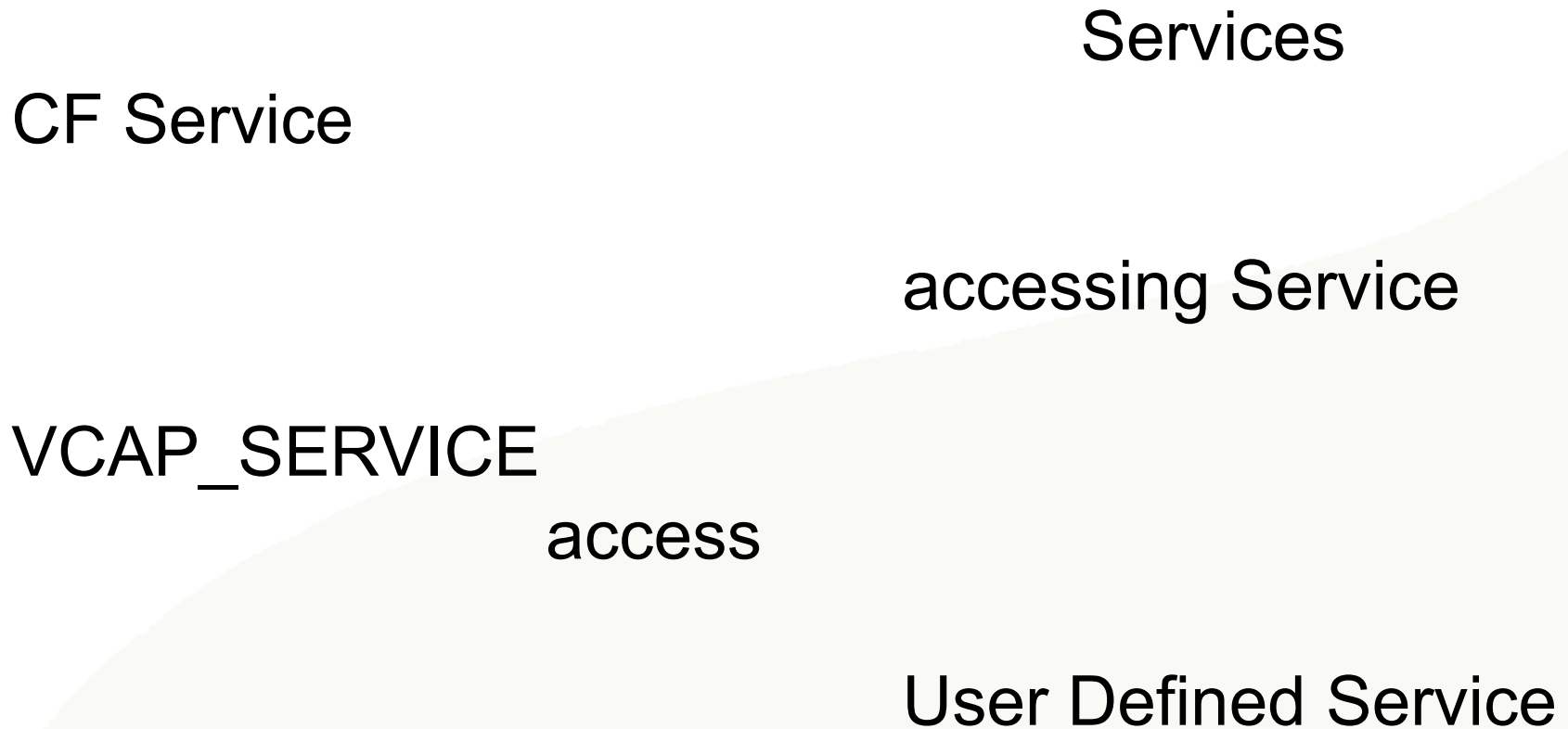
```
{
  user-provided: [
    {
      name: "mydb",
      label: "user-provided",
      tags: [ ],
      credentials: {
        hostname: "db.example.com",
        port: "1234",
        username: "dbuser",
        password: "dbpasswd",
        name: "mydb"
      }
    }
  ]
}
```

Example: Application with Multiple Services

```
VCAP_SERVICES: {  
  "rediscloud": [  
    {  
      "credentials": {  
        "hostname": "redisvr...com",  
        "password": "wU974wucDT45Jc",  
        "port": "19016"  
      },  
      "label": "rediscloud",  
      "name": "session-replication",  
      "plan": "25mb",  
      "tags": [  
        "Data Stores",  
        "Cloud Databases",  
        "Developer Tools",  
        "Data Store",  
        "key-value",  
        "redis"  
      ]  
    }  
  ],  
}
```

```
"user-provided": [  
  {  
    "credentials": {  
      "uri": "http://review.cfapps.io"  
    },  
    "label": "user-provided",  
    "name": "reviews",  
    "syslog_drain_url": "",  
    "tags": []  
  },  
  {  
    "credentials": {  
      "uri": "http://products.cfapps.io"  
    },  
    "label": "user-provided",  
    "name": "products",  
    "syslog_drain_url": "",  
    "tags": []  
  }  
]
```


Recap



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