

전자정부표준프레임워크 기반의 Open PaaS 개발

MySQL 서비스팩 설치 가이드

(Bosh-lite)

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| 승인자 | 현재욱 (인) | 2015.8. |

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개 정 이 력

| 버전 | 작성일 | 변경내용[[1]](#footnote-1) | 작성자 | 승인자 |
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| 1.0 | 2015.8.17 | 최초작성 | 송창학 | 현재욱 |
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목차

[1. 문서 개요 4](#_Toc429404116)

[*1.1.* *목적* 4](#_Toc429404117)

[*1.2.* *범위* 4](#_Toc429404118)

[*1.3.* *시스템 구성도* 4](#_Toc429404119)

[*1.4.* *참고자료* 5](#_Toc429404120)

[2. MySQL 서비스팩 설치 6](#_Toc429404121)

[*2.1.* *설치전 준비사항* 6](#_Toc429404122)

[*2.2.* *MySQL 서비스 릴리즈 업로드* 6](#_Toc429404123)

[*2.3.* *MySQL 서비스 Deployment 파일 수정 및 배포* 13](#_Toc429404124)

[*2.4.* *MySQL 서비스 브로커 등록* 92](#_Toc429404125)

[3. MySQL 연동 Sample Web App 설명 94](#_Toc429404126)

[*3.1.* *Sample Web App 구조* 94](#_Toc429404127)

[*3.2.* *개방형 클라우드 플랫폼에서 서비스 신청* 94](#_Toc429404128)

[*3.3.* *Sample Web App에 서비스 바인드 신청 및 App 확인* 95](#_Toc429404129)

# 문서 개요

## ***목적***

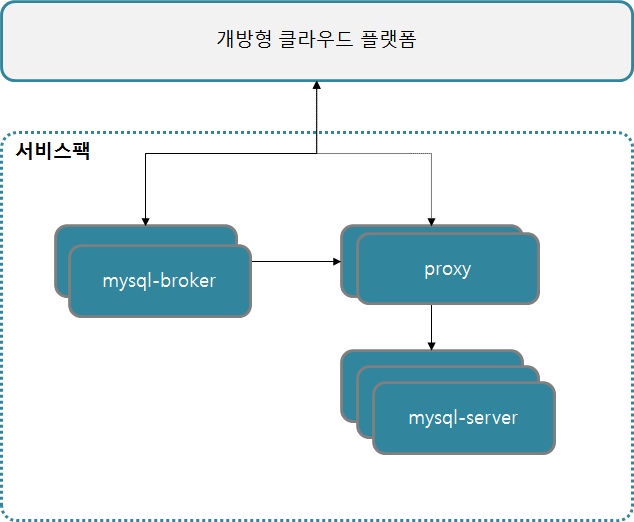
본 문서(MySQL 서비스팩 설치 가이드)는 전자정부표준프레임워크 기반의 Open PaaS에서 제공되는 서비스팩인 MySQL 서비스팩을 Bosh를 이용하여 설치 하는 방법과 Open PaaS의 SaaS 형태로 제공하는 Application 에서 MySQL 서비스를 사용하는 방법을 기술하였다.

## ***범위***

설치 범위는 MySQL 서비스팩을 검증하기 위한 기본 설치를 기준으로 작성하였다.

## ***시스템 구성도***

본 문서의 설치된 시스템 구성도입니다. MySQL Server, MySQL 서비스 브로커, Proxy로 최소사항을 구성하였다.



## ***참고자료***

<http://bosh.io/docs>

<http://docs.cloudfoundry.org/>

# MySQL 서비스팩 설치

## ***설치전 준비사항***

본 설치 가이드는 Linux 환경에서 설치하는 것을 기준으로 하였다.

서비스팩 설치를 위해서는 먼저 BOSH-lite 가 설치 되어 있어야 하고 BOSH 에 로그인 및 타켓 설정이 되어 있어야 한다.

BOSH-lite 가 설치 되어 있지 않을 경우 먼저 BOSH-lite 설치 가이드 문서를 참고 하여 BOSH-lite를 설치 해야 한다.

OpenPaaS 에서 제공하는 압축된 릴리즈 파일들을 다운받는다. (OpenPaaS-Deployment.zip, OpenPaaS-Sample-Apps.zip, OpenPaaS-Services.zip)

## ***MySQL 서비스 릴리즈 업로드***

* OpenPaaS-Services.zip 파일 압축을 풀고 폴더안에 있는 MySQL 서비스 릴리즈 openpaas-mysql-release-beta-1.0.tgz 파일을 복사한다.

업로드할 openpaas-mysql-release-beta-1.0.tgz 파일을 확인한다.

|  |
| --- |
| $ ls –all |

* 업로드 되어 있는 릴리즈 목록을 확인한다.

|  |
| --- |
| $ bosh releases    Mysql 서비스 릴리즈가 업로드 되어 있지 않은 것을 확인 |

* MySQL 서비스 릴리즈 파일을 업로드한다.

|  |
| --- |
| $ bosh upload release {서비스 릴리즈 파일 PATH}  $ bosh upload release openpaas-mysql-release-beta-1.0.tgz |

* 업로드 된 MySQL 릴리즈를 확인한다.

|  |
| --- |
| $ bosh releases    Mysql 서비스 릴리즈가 업로드 되어 있는 것을 확인 |

## ***MySQL 서비스 Deployment 파일 수정 및 배포***

BOSH Deployment manifest 는 components 요소 및 배포의 속성을 정의한 YAML[[2]](#footnote-2) 파일이다.

Deployment manifest 에는 sotfware를 설치 하기 위해서 어떤 Stemcell[[3]](#footnote-3)(OS, BOSH agent) 을 사용할것이며 Release[[4]](#footnote-4)(Software packages, Config templates, Scripts) 이름과 버전, VMs 용량, Jobs params 등을 정의가 되어 있다.

* OpenPaaS-Deployment.zip 파일 압축을 풀고 폴더안에 있는 lite용 MySQL Deployment 화일인 openpaas-mysql-lite.yml 를 복사한다.

다운로드 받은 Deployment Yml 파일을 확인한다. (openpaas-mysql-lite.yml)

|  |
| --- |
| $ ls –all |

* Director UUID를 확인한다.

BOSH CLI가 배포에 대한 모든 작업을 허용하기위한 현재 대상 BOSH Director의 UUID와 일치해야한다. ‘bosh status’ CLI 을 통해서 현재 BOSH Director 에 target 되어 있는 UUID를 확인 할 수 있다.

|  |
| --- |
| $ bosh status |

* Deploy시 사용할 Stemcell을 확인한다. (Stemcell 2776 버전 사용)

|  |
| --- |
| $ bosh stemcells    Stemcell 목록이 존재 하지 않을 경우 BOSH-lite 설치 가이드 문서를 참고 하여 Stemcell 2776 버전을 업로드를 해야 한다. |

* openpaas-mysql-lite.yml Deployment 파일을 서버 환경에 맞게 수정한다. (빨간색으로 표시된 부분만 수정)

|  |
| --- |
| $ vi openpaas-mysql-lite.yml  # openpaas-mysql-lite 설정 파일 내용  compilation: # 컴파일시 필요한 가상머신의 속성(필수)  cloud\_properties: # 컴파일 VM을 만드는 데 필요한 IaaS의 특정 속성 (instance\_type, availability\_zone), 직접 cpu,disk,ram 사이즈를 넣어도 됨  name: random  network: services1 # Networks block에서 선언한 network 이름(필수)  reuse\_compilation\_vms: true # 컴파일지 VM 재사용 여부(옵션)  workers: 6 # 컴파일 하는 가상머신의 최대수(필수)  director\_uuid: xxxxx #bosh status 에서 확인한 Director UUID을 입력(필수)  disk\_pools:  - cloud\_properties: {}  disk\_size: 100000 # 디스크 사이즈 100G  name: mysql-persistent-disk # 영구적 디스크 pool 이름  jobs:  - instances: 1 # job 인스턴스 수(필수)  name: mysql\_z1 # 작업 이름(필수): MySQL 서버  networks: # 네트워크 구성정보  - name: mysql1  static\_ips:  - 10.244.7.2  persistent\_disk\_pool: mysql-persistent-disk # 영구적 디스크 pool 정의(옵션)  properties:  admin\_password: password # MySQL 어드민 패스워드  cluster\_ips: # 클러스터 구성시 IPs(필수)  - 10.244.7.2  - 10.244.8.2  - 10.244.9.2  max\_heap\_table\_size: null  network\_name: mysql1  seeded\_databases: null  syslog\_aggregator: null  tmp\_table\_size: null  wsrep\_max\_ws\_rows: null  wsrep\_max\_ws\_size: null  release: openpaas-mysql # 서비스 릴리즈 이름(필수)  resource\_pool: mysql\_z1 # Resource Pools block에 정의한 resource pool 이름(필수)  template: mysql # job template 이름(필수)  - instances: 1  name: mysql\_z2  networks:  - name: mysql2  static\_ips:  - 10.244.8.2  persistent\_disk\_pool: mysql-persistent-disk  properties:  admin\_password: password  cluster\_ips:  - 10.244.7.2  - 10.244.8.2  - 10.244.9.2  max\_heap\_table\_size: null  network\_name: mysql2  seeded\_databases: null  syslog\_aggregator: null  tmp\_table\_size: null  wsrep\_max\_ws\_rows: null  wsrep\_max\_ws\_size: null  release: openpaas-mysql  resource\_pool: mysql\_z2  template: mysql  - instances: 1  name: mysql\_z3  networks:  - name: mysql3  static\_ips:  - 10.244.9.2  persistent\_disk\_pool: mysql-persistent-disk  properties:  admin\_password: password  cluster\_ips:  - 10.244.7.2  - 10.244.8.2  - 10.244.9.2  max\_heap\_table\_size: null  network\_name: mysql3  seeded\_databases: null  syslog\_aggregator: null  tmp\_table\_size: null  wsrep\_max\_ws\_rows: null  wsrep\_max\_ws\_size: null  release: openpaas-mysql  resource\_pool: mysql\_z3  template: mysql  - instances: 1  name: proxy\_z1 # 작업 이름(필수): proxy  networks:  - name: mysql1  static\_ips:  - 10.244.7.6 # 사용할 IP addresses 정의(필수): Proxy IP  properties:  cluster\_ips: # MySQL 서버 IP  - 10.244.7.2  - 10.244.8.2  - 10.244.9.2  external\_host: p-mysql.10.244.0.34.xip.io # CF 설치시 설정한 외부 호스트 정보(필수)  nats: # CF 설치시 설치한 nats 정보 (필수)  machines:  - 10.244.0.6  password: nats  port: 4222  user: nats  network\_name: mysql1  proxy: # proxy 정보 (필수)  api\_force\_https: null  api\_password: password # proxy api 유저 비밀번호(필수)  api\_username: username # proxy api 유저 아이디  health\_port: null  syslog\_aggregator: null  release: openpaas-mysql  resource\_pool: proxy\_z1  template: proxy  - instances: 1  name: proxy\_z2  networks:  - name: mysql2  static\_ips:  - 10.244.8.6  properties:  cluster\_ips:  - 10.244.7.2  - 10.244.8.2  - 10.244.9.2  external\_host: p-mysql.10.244.0.34.xip.io  nats:  machines:  - 10.244.0.6  password: nats  port: 4222  user: nats  network\_name: mysql2  proxy:  api\_force\_https: null  api\_password: password  api\_username: username  health\_port: null  syslog\_aggregator: null  release: openpaas-mysql  resource\_pool: proxy\_z2  template: proxy  - instances: 1  name: openpaas-mysql-broker\_z1 # 작업 이름(필수): 서비스 브로커  networks:  - name: mysql1  properties:  auth\_password: password # 브로커 접근 아이디 비밀번호(필수)  auth\_username: admin # 브로커 접근 아이디(필수)  cc\_api\_uri: https://api.10.244.0.34.xip.io # CF 설치시 설정한 api uri 정보(필수)  cookie\_secret: 94046872-2602-4ca6-8d07-8b0da9762477  external\_host: p-mysql.10.244.0.34.xip.io  max\_user\_connections\_default: 40  mysql\_node:  admin\_password: password  host: 10.244.7.6  persistent\_disk: 100000 # 영구적 디스크 사이즈 정의(옵션): 100G  nats: # CF 설치시 설정하는 Nats 정보 (필수)  machines:  - 10.244.0.6  password: nats  port: 4222  user: nats  network\_name: mysql1  networks:  broker\_network: mysql1  services:  - dashboard\_client: # 서비스 dashboard client 정보  id: p-mysql # 서비스 dashboard 에 접속할 ID  secret: p-mysql-secret # 서비스 dashboard 에 접속시 사용할 secret  description: MySQL databases on demand # 서비스 설명  id: 44b26033-1f54-4087-b7bc-da9652c2a539 # 서비스 아이디(고유식별자)  metadata:  displayName: MySQL for Pivotal Cloud Foundry # 화면에서 보여줄 서비스 설명  documentationUrl: http://docs.pivotal.io/p-mysql/ # 문서제공되는 Url  imageUrl: data:image/png;base64,  longDescription: Creating a service instance provisions a database. Binding  applications provisions unique credentials for each application to access  the database. # 서비스 상세 설명  providerDisplayName: Pivotal Software # provider 이름  supportUrl: https://support.pivotal.io # 서포트 가능한 Url  name: p-mysql # 서비스 이름  plan\_updateable: true # plan 업데이트 가능여부  plans: # plan 정보  - description: Shared MySQL Server # plan 설명  id: ab08f1bc-e6fc-4b56-a767-ee0fea6e3f20 # plan 아이디  max\_storage\_mb: 10 # plan 정보: 10mb 저장공간  max\_user\_connections: 20 # plan 정보: 사용자 접속수  metadata:  bullets: # 화면에 제공할 plan 정보  - Shared MySQL server  - 100 MB storage  - 20 concurrent connections  costs: # 과금 정책 설정  - amount:  usd: 0 # US 달러: 0달러  unit: MONTH # 월별 징수  displayName: 100 MB  name: 100mb # plan 이름  - description: Shared MySQL Server  id: 11d0aa36-dcec-4021-85f5-ea4d9a5c8342  max\_storage\_mb: 20  max\_user\_connections: 40  metadata:  bullets:  - Shared MySQL server  - 1000 MB storage  - 40 concurrent connections  costs:  - amount:  usd: 0  unit: MONTH  displayName: 1 GB  name: 1gb  tags: # 테그 정보  - mysql  skip\_ssl\_validation: true  ssl\_enabled: null  syslog\_aggregator: null  release: openpaas-mysql  resource\_pool: openpaas-mysql-broker\_z1 # Resource Pools block에 정의한 resource pool 이름(필수)  template: cf-mysql-broker # job template 이름(필수)  - instances: 1  name: openpaas-mysql-broker\_z2  networks:  - name: mysql2  properties:  auth\_password: password  auth\_username: admin  cc\_api\_uri: https://api.10.244.0.34.xip.io  cookie\_secret: 94046872-2602-4ca6-8d07-8b0da9762477  external\_host: p-mysql.10.244.0.34.xip.io  max\_user\_connections\_default: 40  mysql\_node:  admin\_password: password  host: 10.244.7.6  persistent\_disk: 100000  nats:  machines:  - 10.244.0.6  password: nats  port: 4222  user: nats  network\_name: mysql2  networks:  broker\_network: mysql2  services:  - dashboard\_client:  id: p-mysql  secret: p-mysql-secret  description: MySQL databases on demand  id: 44b26033-1f54-4087-b7bc-da9652c2a539  metadata:  displayName: MySQL for Pivotal Cloud Foundry  documentationUrl: http://docs.pivotal.io/p-mysql/  imageUrl: data:image/png;base64,  longDescription: Creating a service instance provisions a database. Binding  applications provisions unique credentials for each application to access  the database.  providerDisplayName: Pivotal Software  supportUrl: https://support.pivotal.io  name: p-mysql  plan\_updateable: true  plans:  - description: Shared MySQL Server  id: ab08f1bc-e6fc-4b56-a767-ee0fea6e3f20  max\_storage\_mb: 10  max\_user\_connections: 20  metadata:  bullets:  - Shared MySQL server  - 100 MB storage  - 20 concurrent connections  costs:  - amount:  usd: 0  unit: MONTH  displayName: 100 MB  name: 100mb  - description: Shared MySQL Server  id: 11d0aa36-dcec-4021-85f5-ea4d9a5c8342  max\_storage\_mb: 20  max\_user\_connections: 40  metadata:  bullets:  - Shared MySQL server  - 1000 MB storage  - 40 concurrent connections  costs:  - amount:  usd: 0  unit: MONTH  displayName: 1 GB  name: 1gb  tags:  - mysql  skip\_ssl\_validation: true  ssl\_enabled: null  syslog\_aggregator: null  release: openpaas-mysql  resource\_pool: openpaas-mysql-broker\_z2  template: cf-mysql-broker  - instances: 1  lifecycle: errand # bosh deploy시 vm에 생성되어 설치 되지 않고 bosh errand 로 실행할때 설정, 주로 테스트 용도에 쓰임  name: broker-registrar # 작업 이름: 서비스 브로커 등록  networks:  - name: mysql1  properties:  broker:  host: p-mysql.10.244.0.34.xip.io  name: p-mysql  password: password  username: admin  cf:  admin\_password: admin  admin\_username: admin  api\_url: https://api.10.244.0.34.xip.io  apps\_domain: 10.244.0.34.xip.io  skip\_ssl\_validation: true  release: openpaas-mysql  resource\_pool: errands\_z1  template: broker-registrar  - instances: 1  lifecycle: errand  name: broker-deregistrar  networks:  - name: mysql1  properties:  broker:  name: p-mysql  cf:  admin\_password: admin  admin\_username: admin  api\_url: https://api.10.244.0.34.xip.io  apps\_domain: 10.244.0.34.xip.io  skip\_ssl\_validation: true  release: openpaas-mysql  resource\_pool: errands\_z1  template: broker-deregistrar  - instances: 1  lifecycle: errand  name: acceptance-tests  networks:  - name: mysql1  properties:  broker:  host: p-mysql.10.244.0.34.xip.io  cf:  admin\_password: admin  admin\_username: admin  api\_url: https://api.10.244.0.34.xip.io  apps\_domain: 10.244.0.34.xip.io  skip\_ssl\_validation: true  proxy:  api\_force\_https: null  api\_password: password  api\_username: username  external\_host: p-mysql.10.244.0.34.xip.io  skip\_ssl\_validation: null  service:  max\_user\_connections\_default: 40  name: p-mysql  plans:  - max\_storage\_mb: 10  max\_user\_connections: 20  plan\_name: 100mb  - max\_storage\_mb: 20  max\_user\_connections: 40  plan\_name: 1gb  smoke\_tests\_only: null  release: openpaas-mysql  resource\_pool: errands\_z1  template: acceptance-tests  meta:  environment: null  syslog\_aggregator: null  name: openpaas-mysql-service  networks: # 네트워크 블록에 나열된 각 서브 블록이 참조 할 수있는 작업이 네트워크 구성을 지정, bosh lite 에서는 제공하는 네트워크를 수정 없이 사용  - name: services1  subnets:  - cloud\_properties:  name: random  range: 10.244.1.0/30  reserved:  - 10.244.1.1  static:  - 10.244.1.2  - cloud\_properties:  name: random  range: 10.244.1.4/30  reserved:  - 10.244.1.5  static:  - 10.244.1.6  - cloud\_properties:  name: random  range: 10.244.1.8/30  reserved:  - 10.244.1.9  static:  - 10.244.1.10  - cloud\_properties:  name: random  range: 10.244.1.12/30  reserved:  - 10.244.1.13  static:  - 10.244.1.14  - cloud\_properties:  name: random  range: 10.244.1.16/30  reserved:  - 10.244.1.17  static:  - 10.244.1.18  - cloud\_properties:  name: random  range: 10.244.1.20/30  reserved:  - 10.244.1.21  static:  - 10.244.1.22  - cloud\_properties:  name: random  range: 10.244.1.24/30  reserved:  - 10.244.1.25  static:  - 10.244.1.26  - cloud\_properties:  name: random  range: 10.244.1.28/30  reserved:  - 10.244.1.29  static:  - 10.244.1.30  - cloud\_properties:  name: random  range: 10.244.1.32/30  reserved:  - 10.244.1.33  static:  - 10.244.1.34  - cloud\_properties:  name: random  range: 10.244.1.36/30  reserved:  - 10.244.1.37  static:  - 10.244.1.38  - cloud\_properties:  name: random  range: 10.244.1.40/30  reserved:  - 10.244.1.41  static:  - 10.244.1.42  - cloud\_properties:  name: random  range: 10.244.1.44/30  reserved:  - 10.244.1.45  static:  - 10.244.1.46  - cloud\_properties:  name: random  range: 10.244.1.48/30  reserved:  - 10.244.1.49  static:  - 10.244.1.50  - cloud\_properties:  name: random  range: 10.244.1.52/30  reserved:  - 10.244.1.53  static:  - 10.244.1.54  - cloud\_properties:  name: random  range: 10.244.1.56/30  reserved:  - 10.244.1.57  static:  - 10.244.1.58  - cloud\_properties:  name: random  range: 10.244.1.60/30  reserved:  - 10.244.1.61  static:  - 10.244.1.62  - cloud\_properties:  name: random  range: 10.244.1.64/30  reserved:  - 10.244.1.65  static:  - 10.244.1.66  - cloud\_properties:  name: random  range: 10.244.1.68/30  reserved:  - 10.244.1.69  static:  - 10.244.1.70  - cloud\_properties:  name: random  range: 10.244.1.72/30  reserved:  - 10.244.1.73  static:  - 10.244.1.74  - cloud\_properties:  name: random  range: 10.244.1.76/30  reserved:  - 10.244.1.77  static:  - 10.244.1.78  - cloud\_properties:  name: random  range: 10.244.1.80/30  reserved:  - 10.244.1.81  static:  - 10.244.1.82  - cloud\_properties:  name: random  range: 10.244.1.84/30  reserved:  - 10.244.1.85  static:  - 10.244.1.86  - cloud\_properties:  name: random  range: 10.244.1.88/30  reserved:  - 10.244.1.89  static:  - 10.244.1.90  - cloud\_properties:  name: random  range: 10.244.1.92/30  reserved:  - 10.244.1.93  static:  - 10.244.1.94  - cloud\_properties:  name: random  range: 10.244.1.96/30  reserved:  - 10.244.1.97  static:  - 10.244.1.98  - cloud\_properties:  name: random  range: 10.244.1.100/30  reserved:  - 10.244.1.101  static:  - 10.244.1.102  - cloud\_properties:  name: random  range: 10.244.1.104/30  reserved:  - 10.244.1.105  static:  - 10.244.1.106  - cloud\_properties:  name: random  range: 10.244.1.108/30  reserved:  - 10.244.1.109  static:  - 10.244.1.110  - cloud\_properties:  name: random  range: 10.244.1.112/30  reserved:  - 10.244.1.113  static:  - 10.244.1.114  - cloud\_properties:  name: random  range: 10.244.1.116/30  reserved:  - 10.244.1.117  static:  - 10.244.1.118  - cloud\_properties:  name: random  range: 10.244.1.120/30  reserved:  - 10.244.1.121  static:  - 10.244.1.122  - cloud\_properties:  name: random  range: 10.244.1.124/30  reserved:  - 10.244.1.125  static:  - 10.244.1.126  - cloud\_properties:  name: random  range: 10.244.1.128/30  reserved:  - 10.244.1.129  static: []  - cloud\_properties:  name: random  range: 10.244.1.132/30  reserved:  - 10.244.1.133  static: []  - cloud\_properties:  name: random  range: 10.244.1.136/30  reserved:  - 10.244.1.137  static: []  - cloud\_properties:  name: random  range: 10.244.1.140/30  reserved:  - 10.244.1.141  static: []  - cloud\_properties:  name: random  range: 10.244.1.144/30  reserved:  - 10.244.1.145  static: []  - cloud\_properties:  name: random  range: 10.244.1.148/30  reserved:  - 10.244.1.149  static: []  - cloud\_properties:  name: random  range: 10.244.1.152/30  reserved:  - 10.244.1.153  static: []  - cloud\_properties:  name: random  range: 10.244.1.156/30  reserved:  - 10.244.1.157  static: []  - cloud\_properties:  name: random  range: 10.244.1.160/30  reserved:  - 10.244.1.161  static: []  - cloud\_properties:  name: random  range: 10.244.1.164/30  reserved:  - 10.244.1.165  static: []  - cloud\_properties:  name: random  range: 10.244.1.168/30  reserved:  - 10.244.1.169  static: []  - cloud\_properties:  name: random  range: 10.244.1.172/30  reserved:  - 10.244.1.173  static: []  - cloud\_properties:  name: random  range: 10.244.1.176/30  reserved:  - 10.244.1.177  static: []  - cloud\_properties:  name: random  range: 10.244.1.180/30  reserved:  - 10.244.1.181  static: []  - cloud\_properties:  name: random  range: 10.244.1.184/30  reserved:  - 10.244.1.185  static: []  - cloud\_properties:  name: random  range: 10.244.1.188/30  reserved:  - 10.244.1.189  static: []  - cloud\_properties:  name: random  range: 10.244.1.192/30  reserved:  - 10.244.1.193  static: []  - cloud\_properties:  name: random  range: 10.244.1.196/30  reserved:  - 10.244.1.197  static: []  - cloud\_properties:  name: random  range: 10.244.1.200/30  reserved:  - 10.244.1.201  static: []  - cloud\_properties:  name: random  range: 10.244.1.204/30  reserved:  - 10.244.1.205  static: []  - cloud\_properties:  name: random  range: 10.244.1.208/30  reserved:  - 10.244.1.209  static: []  - cloud\_properties:  name: random  range: 10.244.1.212/30  reserved:  - 10.244.1.213  static: []  - cloud\_properties:  name: random  range: 10.244.1.216/30  reserved:  - 10.244.1.217  static: []  - cloud\_properties:  name: random  range: 10.244.1.220/30  reserved:  - 10.244.1.221  static: []  - cloud\_properties:  name: random  range: 10.244.1.224/30  reserved:  - 10.244.1.225  static: []  - cloud\_properties:  name: random  range: 10.244.1.228/30  reserved:  - 10.244.1.229  static: []  - cloud\_properties:  name: random  range: 10.244.1.232/30  reserved:  - 10.244.1.233  static: []  - cloud\_properties:  name: random  range: 10.244.1.236/30  reserved:  - 10.244.1.237  static: []  - cloud\_properties:  name: random  range: 10.244.1.240/30  reserved:  - 10.244.1.241  static: []  - cloud\_properties:  name: random  range: 10.244.1.244/30  reserved:  - 10.244.1.245  static: []  - cloud\_properties:  name: random  range: 10.244.1.248/30  reserved:  - 10.244.1.249  static: []  - cloud\_properties:  name: random  range: 10.244.1.252/30  reserved:  - 10.244.1.253  static: []  - name: services2  subnets:  - cloud\_properties:  name: random  range: 10.244.3.0/30  reserved:  - 10.244.3.1  static:  - 10.244.3.2  - cloud\_properties:  name: random  range: 10.244.3.4/30  reserved:  - 10.244.3.5  static:  - 10.244.3.6  - cloud\_properties:  name: random  range: 10.244.3.8/30  reserved:  - 10.244.3.9  static:  - 10.244.3.10  - cloud\_properties:  name: random  range: 10.244.3.12/30  reserved:  - 10.244.3.13  static:  - 10.244.3.14  - cloud\_properties:  name: random  range: 10.244.3.16/30  reserved:  - 10.244.3.17  static:  - 10.244.3.18  - cloud\_properties:  name: random  range: 10.244.3.20/30  reserved:  - 10.244.3.21  static:  - 10.244.3.22  - cloud\_properties:  name: random  range: 10.244.3.24/30  reserved:  - 10.244.3.25  static:  - 10.244.3.26  - cloud\_properties:  name: random  range: 10.244.3.28/30  reserved:  - 10.244.3.29  static:  - 10.244.3.30  - cloud\_properties:  name: random  range: 10.244.3.32/30  reserved:  - 10.244.3.33  static:  - 10.244.3.34  - cloud\_properties:  name: random  range: 10.244.3.36/30  reserved:  - 10.244.3.37  static:  - 10.244.3.38  - cloud\_properties:  name: random  range: 10.244.3.40/30  reserved:  - 10.244.3.41  static:  - 10.244.3.42  - cloud\_properties:  name: random  range: 10.244.3.44/30  reserved:  - 10.244.3.45  static:  - 10.244.3.46  - cloud\_properties:  name: random  range: 10.244.3.48/30  reserved:  - 10.244.3.49  static:  - 10.244.3.50  - cloud\_properties:  name: random  range: 10.244.3.52/30  reserved:  - 10.244.3.53  static:  - 10.244.3.54  - cloud\_properties:  name: random  range: 10.244.3.56/30  reserved:  - 10.244.3.57  static:  - 10.244.3.58  - cloud\_properties:  name: random  range: 10.244.3.60/30  reserved:  - 10.244.3.61  static:  - 10.244.3.62  - cloud\_properties:  name: random  range: 10.244.3.64/30  reserved:  - 10.244.3.65  static:  - 10.244.3.66  - cloud\_properties:  name: random  range: 10.244.3.68/30  reserved:  - 10.244.3.69  static:  - 10.244.3.70  - cloud\_properties:  name: random  range: 10.244.3.72/30  reserved:  - 10.244.3.73  static:  - 10.244.3.74  - cloud\_properties:  name: random  range: 10.244.3.76/30  reserved:  - 10.244.3.77  static:  - 10.244.3.78  - cloud\_properties:  name: random  range: 10.244.3.80/30  reserved:  - 10.244.3.81  static:  - 10.244.3.82  - cloud\_properties:  name: random  range: 10.244.3.84/30  reserved:  - 10.244.3.85  static:  - 10.244.3.86  - cloud\_properties:  name: random  range: 10.244.3.88/30  reserved:  - 10.244.3.89  static:  - 10.244.3.90  - cloud\_properties:  name: random  range: 10.244.3.92/30  reserved:  - 10.244.3.93  static:  - 10.244.3.94  - cloud\_properties:  name: random  range: 10.244.3.96/30  reserved:  - 10.244.3.97  static:  - 10.244.3.98  - cloud\_properties:  name: random  range: 10.244.3.100/30  reserved:  - 10.244.3.101  static:  - 10.244.3.102  - cloud\_properties:  name: random  range: 10.244.3.104/30  reserved:  - 10.244.3.105  static:  - 10.244.3.106  - cloud\_properties:  name: random  range: 10.244.3.108/30  reserved:  - 10.244.3.109  static:  - 10.244.3.110  - cloud\_properties:  name: random  range: 10.244.3.112/30  reserved:  - 10.244.3.113  static:  - 10.244.3.114  - cloud\_properties:  name: random  range: 10.244.3.116/30  reserved:  - 10.244.3.117  static:  - 10.244.3.118  - cloud\_properties:  name: random  range: 10.244.3.120/30  reserved:  - 10.244.3.121  static:  - 10.244.3.122  - cloud\_properties:  name: random  range: 10.244.3.124/30  reserved:  - 10.244.3.125  static:  - 10.244.3.126  - cloud\_properties:  name: random  range: 10.244.3.128/30  reserved:  - 10.244.3.129  static: []  - cloud\_properties:  name: random  range: 10.244.3.132/30  reserved:  - 10.244.3.133  static: []  - cloud\_properties:  name: random  range: 10.244.3.136/30  reserved:  - 10.244.3.137  static: []  - cloud\_properties:  name: random  range: 10.244.3.140/30  reserved:  - 10.244.3.141  static: []  - cloud\_properties:  name: random  range: 10.244.3.144/30  reserved:  - 10.244.3.145  static: []  - cloud\_properties:  name: random  range: 10.244.3.148/30  reserved:  - 10.244.3.149  static: []  - cloud\_properties:  name: random  range: 10.244.3.152/30  reserved:  - 10.244.3.153  static: []  - cloud\_properties:  name: random  range: 10.244.3.156/30  reserved:  - 10.244.3.157  static: []  - cloud\_properties:  name: random  range: 10.244.3.160/30  reserved:  - 10.244.3.161  static: []  - cloud\_properties:  name: random  range: 10.244.3.164/30  reserved:  - 10.244.3.165  static: []  - cloud\_properties:  name: random  range: 10.244.3.168/30  reserved:  - 10.244.3.169  static: []  - cloud\_properties:  name: random  range: 10.244.3.172/30  reserved:  - 10.244.3.173  static: []  - cloud\_properties:  name: random  range: 10.244.3.176/30  reserved:  - 10.244.3.177  static: []  - cloud\_properties:  name: random  range: 10.244.3.180/30  reserved:  - 10.244.3.181  static: []  - cloud\_properties:  name: random  range: 10.244.3.184/30  reserved:  - 10.244.3.185  static: []  - cloud\_properties:  name: random  range: 10.244.3.188/30  reserved:  - 10.244.3.189  static: []  - cloud\_properties:  name: random  range: 10.244.3.192/30  reserved:  - 10.244.3.193  static: []  - cloud\_properties:  name: random  range: 10.244.3.196/30  reserved:  - 10.244.3.197  static: []  - cloud\_properties:  name: random  range: 10.244.3.200/30  reserved:  - 10.244.3.201  static: []  - cloud\_properties:  name: random  range: 10.244.3.204/30  reserved:  - 10.244.3.205  static: []  - cloud\_properties:  name: random  range: 10.244.3.208/30  reserved:  - 10.244.3.209  static: []  - cloud\_properties:  name: random  range: 10.244.3.212/30  reserved:  - 10.244.3.213  static: []  - cloud\_properties:  name: random  range: 10.244.3.216/30  reserved:  - 10.244.3.217  static: []  - cloud\_properties:  name: random  range: 10.244.3.220/30  reserved:  - 10.244.3.221  static: []  - cloud\_properties:  name: random  range: 10.244.3.224/30  reserved:  - 10.244.3.225  static: []  - cloud\_properties:  name: random  range: 10.244.3.228/30  reserved:  - 10.244.3.229  static: []  - cloud\_properties:  name: random  range: 10.244.3.232/30  reserved:  - 10.244.3.233  static: []  - cloud\_properties:  name: random  range: 10.244.3.236/30  reserved:  - 10.244.3.237  static: []  - cloud\_properties:  name: random  range: 10.244.3.240/30  reserved:  - 10.244.3.241  static: []  - cloud\_properties:  name: random  range: 10.244.3.244/30  reserved:  - 10.244.3.245  static: []  - cloud\_properties:  name: random  range: 10.244.3.248/30  reserved:  - 10.244.3.249  static: []  - cloud\_properties:  name: random  range: 10.244.3.252/30  reserved:  - 10.244.3.253  static: []  - name: mysql1  subnets:  - cloud\_properties:  name: random  range: 10.244.7.0/30  reserved:  - 10.244.7.1  static:  - 10.244.7.2  - cloud\_properties:  name: random  range: 10.244.7.4/30  reserved:  - 10.244.7.5  static:  - 10.244.7.6  - cloud\_properties:  name: random  range: 10.244.7.8/30  reserved:  - 10.244.7.9  static:  - 10.244.7.10  - cloud\_properties:  name: random  range: 10.244.7.12/30  reserved:  - 10.244.7.13  static:  - 10.244.7.14  - cloud\_properties:  name: random  range: 10.244.7.16/30  reserved:  - 10.244.7.17  static:  - 10.244.7.18  - cloud\_properties:  name: random  range: 10.244.7.20/30  reserved:  - 10.244.7.21  static:  - 10.244.7.22  - cloud\_properties:  name: random  range: 10.244.7.24/30  reserved:  - 10.244.7.25  static:  - 10.244.7.26  - cloud\_properties:  name: random  range: 10.244.7.28/30  reserved:  - 10.244.7.29  static:  - 10.244.7.30  - cloud\_properties:  name: random  range: 10.244.7.32/30  reserved:  - 10.244.7.33  static:  - 10.244.7.34  - cloud\_properties:  name: random  range: 10.244.7.36/30  reserved:  - 10.244.7.37  static:  - 10.244.7.38  - cloud\_properties:  name: random  range: 10.244.7.40/30  reserved:  - 10.244.7.41  static:  - 10.244.7.42  - cloud\_properties:  name: random  range: 10.244.7.44/30  reserved:  - 10.244.7.45  static:  - 10.244.7.46  - cloud\_properties:  name: random  range: 10.244.7.48/30  reserved:  - 10.244.7.49  static:  - 10.244.7.50  - cloud\_properties:  name: random  range: 10.244.7.52/30  reserved:  - 10.244.7.53  static:  - 10.244.7.54  - cloud\_properties:  name: random  range: 10.244.7.56/30  reserved:  - 10.244.7.57  static:  - 10.244.7.58  - cloud\_properties:  name: random  range: 10.244.7.60/30  reserved:  - 10.244.7.61  static:  - 10.244.7.62  - cloud\_properties:  name: random  range: 10.244.7.64/30  reserved:  - 10.244.7.65  static:  - 10.244.7.66  - cloud\_properties:  name: random  range: 10.244.7.68/30  reserved:  - 10.244.7.69  static:  - 10.244.7.70  - cloud\_properties:  name: random  range: 10.244.7.72/30  reserved:  - 10.244.7.73  static:  - 10.244.7.74  - cloud\_properties:  name: random  range: 10.244.7.76/30  reserved:  - 10.244.7.77  static:  - 10.244.7.78  - cloud\_properties:  name: random  range: 10.244.7.80/30  reserved:  - 10.244.7.81  static:  - 10.244.7.82  - cloud\_properties:  name: random  range: 10.244.7.84/30  reserved:  - 10.244.7.85  static:  - 10.244.7.86  - cloud\_properties:  name: random  range: 10.244.7.88/30  reserved:  - 10.244.7.89  static:  - 10.244.7.90  - cloud\_properties:  name: random  range: 10.244.7.92/30  reserved:  - 10.244.7.93  static:  - 10.244.7.94  - cloud\_properties:  name: random  range: 10.244.7.96/30  reserved:  - 10.244.7.97  static:  - 10.244.7.98  - cloud\_properties:  name: random  range: 10.244.7.100/30  reserved:  - 10.244.7.101  static:  - 10.244.7.102  - cloud\_properties:  name: random  range: 10.244.7.104/30  reserved:  - 10.244.7.105  static:  - 10.244.7.106  - cloud\_properties:  name: random  range: 10.244.7.108/30  reserved:  - 10.244.7.109  static:  - 10.244.7.110  - cloud\_properties:  name: random  range: 10.244.7.112/30  reserved:  - 10.244.7.113  static:  - 10.244.7.114  - cloud\_properties:  name: random  range: 10.244.7.116/30  reserved:  - 10.244.7.117  static:  - 10.244.7.118  - cloud\_properties:  name: random  range: 10.244.7.120/30  reserved:  - 10.244.7.121  static:  - 10.244.7.122  - cloud\_properties:  name: random  range: 10.244.7.124/30  reserved:  - 10.244.7.125  static:  - 10.244.7.126  - cloud\_properties:  name: random  range: 10.244.7.128/30  reserved:  - 10.244.7.129  static: []  - cloud\_properties:  name: random  range: 10.244.7.132/30  reserved:  - 10.244.7.133  static: []  - cloud\_properties:  name: random  range: 10.244.7.136/30  reserved:  - 10.244.7.137  static: []  - cloud\_properties:  name: random  range: 10.244.7.140/30  reserved:  - 10.244.7.141  static: []  - cloud\_properties:  name: random  range: 10.244.7.144/30  reserved:  - 10.244.7.145  static: []  - cloud\_properties:  name: random  range: 10.244.7.148/30  reserved:  - 10.244.7.149  static: []  - cloud\_properties:  name: random  range: 10.244.7.152/30  reserved:  - 10.244.7.153  static: []  - cloud\_properties:  name: random  range: 10.244.7.156/30  reserved:  - 10.244.7.157  static: []  - cloud\_properties:  name: random  range: 10.244.7.160/30  reserved:  - 10.244.7.161  static: []  - cloud\_properties:  name: random  range: 10.244.7.164/30  reserved:  - 10.244.7.165  static: []  - cloud\_properties:  name: random  range: 10.244.7.168/30  reserved:  - 10.244.7.169  static: []  - cloud\_properties:  name: random  range: 10.244.7.172/30  reserved:  - 10.244.7.173  static: []  - cloud\_properties:  name: random  range: 10.244.7.176/30  reserved:  - 10.244.7.177  static: []  - cloud\_properties:  name: random  range: 10.244.7.180/30  reserved:  - 10.244.7.181  static: []  - cloud\_properties:  name: random  range: 10.244.7.184/30  reserved:  - 10.244.7.185  static: []  - cloud\_properties:  name: random  range: 10.244.7.188/30  reserved:  - 10.244.7.189  static: []  - cloud\_properties:  name: random  range: 10.244.7.192/30  reserved:  - 10.244.7.193  static: []  - cloud\_properties:  name: random  range: 10.244.7.196/30  reserved:  - 10.244.7.197  static: []  - cloud\_properties:  name: random  range: 10.244.7.200/30  reserved:  - 10.244.7.201  static: []  - cloud\_properties:  name: random  range: 10.244.7.204/30  reserved:  - 10.244.7.205  static: []  - cloud\_properties:  name: random  range: 10.244.7.208/30  reserved:  - 10.244.7.209  static: []  - cloud\_properties:  name: random  range: 10.244.7.212/30  reserved:  - 10.244.7.213  static: []  - cloud\_properties:  name: random  range: 10.244.7.216/30  reserved:  - 10.244.7.217  static: []  - cloud\_properties:  name: random  range: 10.244.7.220/30  reserved:  - 10.244.7.221  static: []  - cloud\_properties:  name: random  range: 10.244.7.224/30  reserved:  - 10.244.7.225  static: []  - cloud\_properties:  name: random  range: 10.244.7.228/30  reserved:  - 10.244.7.229  static: []  - cloud\_properties:  name: random  range: 10.244.7.232/30  reserved:  - 10.244.7.233  static: []  - cloud\_properties:  name: random  range: 10.244.7.236/30  reserved:  - 10.244.7.237  static: []  - cloud\_properties:  name: random  range: 10.244.7.240/30  reserved:  - 10.244.7.241  static: []  - cloud\_properties:  name: random  range: 10.244.7.244/30  reserved:  - 10.244.7.245  static: []  - cloud\_properties:  name: random  range: 10.244.7.248/30  reserved:  - 10.244.7.249  static: []  - cloud\_properties:  name: random  range: 10.244.7.252/30  reserved:  - 10.244.7.253  static: []  - name: mysql2  subnets:  - cloud\_properties:  name: random  range: 10.244.8.0/30  reserved:  - 10.244.8.1  static:  - 10.244.8.2  - cloud\_properties:  name: random  range: 10.244.8.4/30  reserved:  - 10.244.8.5  static:  - 10.244.8.6  - cloud\_properties:  name: random  range: 10.244.8.8/30  reserved:  - 10.244.8.9  static:  - 10.244.8.10  - cloud\_properties:  name: random  range: 10.244.8.12/30  reserved:  - 10.244.8.13  static:  - 10.244.8.14  - cloud\_properties:  name: random  range: 10.244.8.16/30  reserved:  - 10.244.8.17  static:  - 10.244.8.18  - cloud\_properties:  name: random  range: 10.244.8.20/30  reserved:  - 10.244.8.21  static:  - 10.244.8.22  - cloud\_properties:  name: random  range: 10.244.8.24/30  reserved:  - 10.244.8.25  static:  - 10.244.8.26  - cloud\_properties:  name: random  range: 10.244.8.28/30  reserved:  - 10.244.8.29  static:  - 10.244.8.30  - cloud\_properties:  name: random  range: 10.244.8.32/30  reserved:  - 10.244.8.33  static:  - 10.244.8.34  - cloud\_properties:  name: random  range: 10.244.8.36/30  reserved:  - 10.244.8.37  static:  - 10.244.8.38  - cloud\_properties:  name: random  range: 10.244.8.40/30  reserved:  - 10.244.8.41  static:  - 10.244.8.42  - cloud\_properties:  name: random  range: 10.244.8.44/30  reserved:  - 10.244.8.45  static:  - 10.244.8.46  - cloud\_properties:  name: random  range: 10.244.8.48/30  reserved:  - 10.244.8.49  static:  - 10.244.8.50  - cloud\_properties:  name: random  range: 10.244.8.52/30  reserved:  - 10.244.8.53  static:  - 10.244.8.54  - cloud\_properties:  name: random  range: 10.244.8.56/30  reserved:  - 10.244.8.57  static:  - 10.244.8.58  - cloud\_properties:  name: random  range: 10.244.8.60/30  reserved:  - 10.244.8.61  static:  - 10.244.8.62  - cloud\_properties:  name: random  range: 10.244.8.64/30  reserved:  - 10.244.8.65  static:  - 10.244.8.66  - cloud\_properties:  name: random  range: 10.244.8.68/30  reserved:  - 10.244.8.69  static:  - 10.244.8.70  - cloud\_properties:  name: random  range: 10.244.8.72/30  reserved:  - 10.244.8.73  static:  - 10.244.8.74  - cloud\_properties:  name: random  range: 10.244.8.76/30  reserved:  - 10.244.8.77  static:  - 10.244.8.78  - cloud\_properties:  name: random  range: 10.244.8.80/30  reserved:  - 10.244.8.81  static:  - 10.244.8.82  - cloud\_properties:  name: random  range: 10.244.8.84/30  reserved:  - 10.244.8.85  static:  - 10.244.8.86  - cloud\_properties:  name: random  range: 10.244.8.88/30  reserved:  - 10.244.8.89  static:  - 10.244.8.90  - cloud\_properties:  name: random  range: 10.244.8.92/30  reserved:  - 10.244.8.93  static:  - 10.244.8.94  - cloud\_properties:  name: random  range: 10.244.8.96/30  reserved:  - 10.244.8.97  static:  - 10.244.8.98  - cloud\_properties:  name: random  range: 10.244.8.100/30  reserved:  - 10.244.8.101  static:  - 10.244.8.102  - cloud\_properties:  name: random  range: 10.244.8.104/30  reserved:  - 10.244.8.105  static:  - 10.244.8.106  - cloud\_properties:  name: random  range: 10.244.8.108/30  reserved:  - 10.244.8.109  static:  - 10.244.8.110  - cloud\_properties:  name: random  range: 10.244.8.112/30  reserved:  - 10.244.8.113  static:  - 10.244.8.114  - cloud\_properties:  name: random  range: 10.244.8.116/30  reserved:  - 10.244.8.117  static:  - 10.244.8.118  - cloud\_properties:  name: random  range: 10.244.8.120/30  reserved:  - 10.244.8.121  static:  - 10.244.8.122  - cloud\_properties:  name: random  range: 10.244.8.124/30  reserved:  - 10.244.8.125  static:  - 10.244.8.126  - cloud\_properties:  name: random  range: 10.244.8.128/30  reserved:  - 10.244.8.129  static: []  - cloud\_properties:  name: random  range: 10.244.8.132/30  reserved:  - 10.244.8.133  static: []  - cloud\_properties:  name: random  range: 10.244.8.136/30  reserved:  - 10.244.8.137  static: []  - cloud\_properties:  name: random  range: 10.244.8.140/30  reserved:  - 10.244.8.141  static: []  - cloud\_properties:  name: random  range: 10.244.8.144/30  reserved:  - 10.244.8.145  static: []  - cloud\_properties:  name: random  range: 10.244.8.148/30  reserved:  - 10.244.8.149  static: []  - cloud\_properties:  name: random  range: 10.244.8.152/30  reserved:  - 10.244.8.153  static: []  - cloud\_properties:  name: random  range: 10.244.8.156/30  reserved:  - 10.244.8.157  static: []  - cloud\_properties:  name: random  range: 10.244.8.160/30  reserved:  - 10.244.8.161  static: []  - cloud\_properties:  name: random  range: 10.244.8.164/30  reserved:  - 10.244.8.165  static: []  - cloud\_properties:  name: random  range: 10.244.8.168/30  reserved:  - 10.244.8.169  static: []  - cloud\_properties:  name: random  range: 10.244.8.172/30  reserved:  - 10.244.8.173  static: []  - cloud\_properties:  name: random  range: 10.244.8.176/30  reserved:  - 10.244.8.177  static: []  - cloud\_properties:  name: random  range: 10.244.8.180/30  reserved:  - 10.244.8.181  static: []  - cloud\_properties:  name: random  range: 10.244.8.184/30  reserved:  - 10.244.8.185  static: []  - cloud\_properties:  name: random  range: 10.244.8.188/30  reserved:  - 10.244.8.189  static: []  - cloud\_properties:  name: random  range: 10.244.8.192/30  reserved:  - 10.244.8.193  static: []  - cloud\_properties:  name: random  range: 10.244.8.196/30  reserved:  - 10.244.8.197  static: []  - cloud\_properties:  name: random  range: 10.244.8.200/30  reserved:  - 10.244.8.201  static: []  - cloud\_properties:  name: random  range: 10.244.8.204/30  reserved:  - 10.244.8.205  static: []  - cloud\_properties:  name: random  range: 10.244.8.208/30  reserved:  - 10.244.8.209  static: []  - cloud\_properties:  name: random  range: 10.244.8.212/30  reserved:  - 10.244.8.213  static: []  - cloud\_properties:  name: random  range: 10.244.8.216/30  reserved:  - 10.244.8.217  static: []  - cloud\_properties:  name: random  range: 10.244.8.220/30  reserved:  - 10.244.8.221  static: []  - cloud\_properties:  name: random  range: 10.244.8.224/30  reserved:  - 10.244.8.225  static: []  - cloud\_properties:  name: random  range: 10.244.8.228/30  reserved:  - 10.244.8.229  static: []  - cloud\_properties:  name: random  range: 10.244.8.232/30  reserved:  - 10.244.8.233  static: []  - cloud\_properties:  name: random  range: 10.244.8.236/30  reserved:  - 10.244.8.237  static: []  - cloud\_properties:  name: random  range: 10.244.8.240/30  reserved:  - 10.244.8.241  static: []  - cloud\_properties:  name: random  range: 10.244.8.244/30  reserved:  - 10.244.8.245  static: []  - cloud\_properties:  name: random  range: 10.244.8.248/30  reserved:  - 10.244.8.249  static: []  - cloud\_properties:  name: random  range: 10.244.8.252/30  reserved:  - 10.244.8.253  static: []  - name: mysql3  subnets:  - cloud\_properties:  name: random  range: 10.244.9.0/30  reserved:  - 10.244.9.1  static:  - 10.244.9.2  - cloud\_properties:  name: random  range: 10.244.9.4/30  reserved:  - 10.244.9.5  static:  - 10.244.9.6  - cloud\_properties:  name: random  range: 10.244.9.8/30  reserved:  - 10.244.9.9  static:  - 10.244.9.10  - cloud\_properties:  name: random  range: 10.244.9.12/30  reserved:  - 10.244.9.13  static:  - 10.244.9.14  - cloud\_properties:  name: random  range: 10.244.9.16/30  reserved:  - 10.244.9.17  static:  - 10.244.9.18  - cloud\_properties:  name: random  range: 10.244.9.20/30  reserved:  - 10.244.9.21  static:  - 10.244.9.22  - cloud\_properties:  name: random  range: 10.244.9.24/30  reserved:  - 10.244.9.25  static:  - 10.244.9.26  - cloud\_properties:  name: random  range: 10.244.9.28/30  reserved:  - 10.244.9.29  static:  - 10.244.9.30  - cloud\_properties:  name: random  range: 10.244.9.32/30  reserved:  - 10.244.9.33  static:  - 10.244.9.34  - cloud\_properties:  name: random  range: 10.244.9.36/30  reserved:  - 10.244.9.37  static:  - 10.244.9.38  - cloud\_properties:  name: random  range: 10.244.9.40/30  reserved:  - 10.244.9.41  static:  - 10.244.9.42  - cloud\_properties:  name: random  range: 10.244.9.44/30  reserved:  - 10.244.9.45  static:  - 10.244.9.46  - cloud\_properties:  name: random  range: 10.244.9.48/30  reserved:  - 10.244.9.49  static:  - 10.244.9.50  - cloud\_properties:  name: random  range: 10.244.9.52/30  reserved:  - 10.244.9.53  static:  - 10.244.9.54  - cloud\_properties:  name: random  range: 10.244.9.56/30  reserved:  - 10.244.9.57  static:  - 10.244.9.58  - cloud\_properties:  name: random  range: 10.244.9.60/30  reserved:  - 10.244.9.61  static:  - 10.244.9.62  - cloud\_properties:  name: random  range: 10.244.9.64/30  reserved:  - 10.244.9.65  static:  - 10.244.9.66  - cloud\_properties:  name: random  range: 10.244.9.68/30  reserved:  - 10.244.9.69  static:  - 10.244.9.70  - cloud\_properties:  name: random  range: 10.244.9.72/30  reserved:  - 10.244.9.73  static:  - 10.244.9.74  - cloud\_properties:  name: random  range: 10.244.9.76/30  reserved:  - 10.244.9.77  static:  - 10.244.9.78  - cloud\_properties:  name: random  range: 10.244.9.80/30  reserved:  - 10.244.9.81  static:  - 10.244.9.82  - cloud\_properties:  name: random  range: 10.244.9.84/30  reserved:  - 10.244.9.85  static:  - 10.244.9.86  - cloud\_properties:  name: random  range: 10.244.9.88/30  reserved:  - 10.244.9.89  static:  - 10.244.9.90  - cloud\_properties:  name: random  range: 10.244.9.92/30  reserved:  - 10.244.9.93  static:  - 10.244.9.94  - cloud\_properties:  name: random  range: 10.244.9.96/30  reserved:  - 10.244.9.97  static:  - 10.244.9.98  - cloud\_properties:  name: random  range: 10.244.9.100/30  reserved:  - 10.244.9.101  static:  - 10.244.9.102  - cloud\_properties:  name: random  range: 10.244.9.104/30  reserved:  - 10.244.9.105  static:  - 10.244.9.106  - cloud\_properties:  name: random  range: 10.244.9.108/30  reserved:  - 10.244.9.109  static:  - 10.244.9.110  - cloud\_properties:  name: random  range: 10.244.9.112/30  reserved:  - 10.244.9.113  static:  - 10.244.9.114  - cloud\_properties:  name: random  range: 10.244.9.116/30  reserved:  - 10.244.9.117  static:  - 10.244.9.118  - cloud\_properties:  name: random  range: 10.244.9.120/30  reserved:  - 10.244.9.121  static:  - 10.244.9.122  - cloud\_properties:  name: random  range: 10.244.9.124/30  reserved:  - 10.244.9.125  static:  - 10.244.9.126  - cloud\_properties:  name: random  range: 10.244.9.128/30  reserved:  - 10.244.9.129  static: []  - cloud\_properties:  name: random  range: 10.244.9.132/30  reserved:  - 10.244.9.133  static: []  - cloud\_properties:  name: random  range: 10.244.9.136/30  reserved:  - 10.244.9.137  static: []  - cloud\_properties:  name: random  range: 10.244.9.140/30  reserved:  - 10.244.9.141  static: []  - cloud\_properties:  name: random  range: 10.244.9.144/30  reserved:  - 10.244.9.145  static: []  - cloud\_properties:  name: random  range: 10.244.9.148/30  reserved:  - 10.244.9.149  static: []  - cloud\_properties:  name: random  range: 10.244.9.152/30  reserved:  - 10.244.9.153  static: []  - cloud\_properties:  name: random  range: 10.244.9.156/30  reserved:  - 10.244.9.157  static: []  - cloud\_properties:  name: random  range: 10.244.9.160/30  reserved:  - 10.244.9.161  static: []  - cloud\_properties:  name: random  range: 10.244.9.164/30  reserved:  - 10.244.9.165  static: []  - cloud\_properties:  name: random  range: 10.244.9.168/30  reserved:  - 10.244.9.169  static: []  - cloud\_properties:  name: random  range: 10.244.9.172/30  reserved:  - 10.244.9.173  static: []  - cloud\_properties:  name: random  range: 10.244.9.176/30  reserved:  - 10.244.9.177  static: []  - cloud\_properties:  name: random  range: 10.244.9.180/30  reserved:  - 10.244.9.181  static: []  - cloud\_properties:  name: random  range: 10.244.9.184/30  reserved:  - 10.244.9.185  static: []  - cloud\_properties:  name: random  range: 10.244.9.188/30  reserved:  - 10.244.9.189  static: []  - cloud\_properties:  name: random  range: 10.244.9.192/30  reserved:  - 10.244.9.193  static: []  - cloud\_properties:  name: random  range: 10.244.9.196/30  reserved:  - 10.244.9.197  static: []  - cloud\_properties:  name: random  range: 10.244.9.200/30  reserved:  - 10.244.9.201  static: []  - cloud\_properties:  name: random  range: 10.244.9.204/30  reserved:  - 10.244.9.205  static: []  - cloud\_properties:  name: random  range: 10.244.9.208/30  reserved:  - 10.244.9.209  static: []  - cloud\_properties:  name: random  range: 10.244.9.212/30  reserved:  - 10.244.9.213  static: []  - cloud\_properties:  name: random  range: 10.244.9.216/30  reserved:  - 10.244.9.217  static: []  - cloud\_properties:  name: random  range: 10.244.9.220/30  reserved:  - 10.244.9.221  static: []  - cloud\_properties:  name: random  range: 10.244.9.224/30  reserved:  - 10.244.9.225  static: []  - cloud\_properties:  name: random  range: 10.244.9.228/30  reserved:  - 10.244.9.229  static: []  - cloud\_properties:  name: random  range: 10.244.9.232/30  reserved:  - 10.244.9.233  static: []  - cloud\_properties:  name: random  range: 10.244.9.236/30  reserved:  - 10.244.9.237  static: []  - cloud\_properties:  name: random  range: 10.244.9.240/30  reserved:  - 10.244.9.241  static: []  - cloud\_properties:  name: random  range: 10.244.9.244/30  reserved:  - 10.244.9.245  static: []  - cloud\_properties:  name: random  range: 10.244.9.248/30  reserved:  - 10.244.9.249  static: []  - cloud\_properties:  name: random  range: 10.244.9.252/30  reserved:  - 10.244.9.253  static: []  properties:  app\_domains:  - 10.244.0.34.xip.io  cf:  admin\_password: admin  admin\_username: admin  api\_url: https://api.10.244.0.34.xip.io  apps\_domain: 10.244.0.34.xip.io  skip\_ssl\_validation: true  default\_mysql\_cluster\_ips:  - 10.244.7.2  - 10.244.8.2  - 10.244.9.2  domain: 10.244.0.34.xip.io  nats:  machines:  - 10.244.0.6  password: nats  port: 4222  user: nats  releases:  - name: openpaas-mysql  version: latest  resource\_pools: # 배포시 사용하는 resource pools를 명시하며 여러 개의 resource pools 을 사용할 경우 name 은 unique 해야함(필수)  - cloud\_properties: # 컴파일 VM을 만드는 데 필요한 IaaS의 특정 속성을 설명 (instance\_type, availability\_zone), 직접 cpu, disk, 메모리 설정가능  name: random  name: mysql\_z1 # 고유한 resource pool 이름  network: mysql1  stemcell:  name: bosh-warden-boshlite-ubuntu-trusty-go\_agent # stemcell 이름(필수)  version: latest # stemcell 버전(필수)  - cloud\_properties:  name: random  name: mysql\_z2  network: mysql1  stemcell:  name: bosh-warden-boshlite-ubuntu-trusty-go\_agent  version: latest  - cloud\_properties:  name: random  name: mysql\_z3  network: mysql1  stemcell:  name: bosh-warden-boshlite-ubuntu-trusty-go\_agent  version: latest  - cloud\_properties:  name: random  name: proxy\_z1  network: mysql1  stemcell:  name: bosh-warden-boshlite-ubuntu-trusty-go\_agent  version: latest  - cloud\_properties:  name: random  name: proxy\_z2  network: mysql2  stemcell:  name: bosh-warden-boshlite-ubuntu-trusty-go\_agent  version: latest  - cloud\_properties:  name: random  name: openpaas-mysql-broker\_z1  network: mysql1  stemcell:  name: bosh-warden-boshlite-ubuntu-trusty-go\_agent  version: latest  - cloud\_properties:  name: random  name: openpaas-mysql-broker\_z2  network: mysql2  stemcell:  name: bosh-warden-boshlite-ubuntu-trusty-go\_agent  version: latest  - cloud\_properties:  name: random  name: errands\_z1  network: mysql1  stemcell:  name: bosh-warden-boshlite-ubuntu-trusty-go\_agent  version: latest  update:  canaries: 1 # canary 인스턴스 수(필수)  canary\_watch\_time: 30000-600000 # canary 인스턴스가 수행하기 위한 대기 시간(필수)  max\_in\_flight: 1 # non-canary 인스턴스가 병렬로 update 하는 최대 개수(필수)  update\_watch\_time: 30000-600000 # non-canary 인스턴스가 수행하기 위한 대기 시간(필수) |

* Deploy 할 deployment manifest 파일을 BOSH 에 지정한다.

|  |
| --- |
| $ bosh deployment {Deployment manifest 파일 PATH}  $ bosh deployment openpaas-mysql-lite.yml |

* MySQL 서비스팩을 배포한다.

|  |
| --- |
| $ bosh deploy |

* 배포된 MySQL 서비스팩을 확인한다.

|  |
| --- |
| $ bosh vms |

## ***MySQL 서비스 브로커 등록***

Mysql 서비스팩 배포가 완료 되었으면 Application에서 서비스 팩을 사용하기 위해서 먼저 MySQL 서비스 브로커를 등록해 주어야 한다.

서비스 브로커 등록시 개방형 클라우드 플랫폼에서 서비스 브로커를 등록 할 수 있는 사용자로 로그인이 되어 있어야 한다.

* 서비스 브로커 목록을 확인한다.

|  |
| --- |
| $ cf service-brokers |

* MySQL 서비스 브로커를 등록한다.

|  |
| --- |
| $ cf create-service-broker {서비스팩 이름} {서비스팩 사용자ID} {서비스팩 사용자비밀번호} http://{서비스팩 URL}   * 서비스팩 이름 : 서비스 팩 관리를 위해 개방형 클라우드 플랫폼에서 보여지는 명칭이다. 서비스 Marketplace에서는 각각의 API 서비스 명이 보여지니 여기서 명칭은 서비스팩 리스트의 명칭이다. * 서비스팩 사용자ID / 비밀번호 : 서비스팩에 접근할 수 있는 사용자 ID입니다. 서비스팩도 하나의 API 서버이기 때문에 아무나 접근을 허용할 수 없어 접근이 가능한 ID/비밀번호를 입력한다. * 서비스팩 URL : 서비스팩이 제공하는 API를 사용할 수 있는 URL을 입력한다.   $ cf create-service-broker mysql-service-broker admin password http://p-mysql.10.244.0.34.xip.io |

* 등록된 MySQL 서비스 브로커를 확인한다.

|  |
| --- |
| $ cf service-brokers |

* 접근 가능한 서비스 목록을 확인한다.

|  |
| --- |
| $ cf service-access    서비스 브로커 생성시 디폴트로 접근을 허용하지 않는다. |

* 특정 조직에 해당 서비스 접근 허용을 할당하고 접근 서비스 목록을 다시 확인한다. (전체 조직)

|  |
| --- |
| $ cf enable-service-access p-mysql  $ cf service-access |

# MySQL 연동 Sample Web App 설명

본 Sample Web App은 개발형 클라우드 플랫폼에 배포되며 MySQL의 서비스를 Provision과 Bind를 한 상태에서 사용이 가능하다.

## ***Sample Web App 구조***

Sample Web App은 개방형 클라우드 플랫폼에 App으로 배포가 된다. App을 배포하여 구동시 Bind 된 MySQL 서비스 연결정보로 접속하여 초기 데이터를 생성하게 된다. 배포 완료 후 정상적으로 App 이 구동되면 브라우져나 curl로 해당 App에 접속 하여 MySQL 환경정보(서비스 연결 정보)와 초기 적재된 데이터를 보여준다.

Sample Web App 구조는 다음과 같다.

|  |  |
| --- | --- |
| **이름** | **설명** |
| src | Sample 소스 디렉토리 |
| manifest | 개방형 클라우드 플랫폼에 app 배포시 필요한 설정을 저장하는 파일 |
| pom.xml | 메이븐 project 설정 파일 |
| target | 메이블 빌드시 생성되는 디렉토리(war 파일, classes 폴더 등) |

* OpenPaaS-Sample-Apps.zip 파일 압축을 풀고 Service 폴더안에 있는 MySQL Sample Web App인 hello-spring-mysql를 복사한다.

|  |
| --- |
| $ ls -all |

## ***개방형 클라우드 플랫폼에서 서비스 신청***

Sample Web App에서 MySQL 서비스를 사용하기 위해서는 서비스 신청(Provision)을 해야 한다.

\*참고: 서비스 신청시 개방형 클라우드 플랫폼에서 서비스를 신청 할 수 있는 사용자로 로그인이 되어 있어야 한다.

* 먼저 개방형 클라우드 플랫폼 Marketplace에서 서비스가 있는지 확인을 한다.

|  |
| --- |
| $ cf marketplace |

* Marketplace에서 원하는 서비스가 있으면 서비스 신청(Provision)을 한다.

|  |
| --- |
| $ cf create-service {서비스명} {서비스플랜} {내서비스명}   * 서비스명 : p-mysql로 Marketplace에서 보여지는 서비스 명칭이다. * 서비스플랜 : 서비스에 대한 정책으로 plans에 있는 정보 중 하나를 선택한다. MySQL 서비스는 100mb, 1gb를 지원한다. * 내서비스명 : 내 서비스에서 보여지는 명칭이다. 이 명칭을 기준으로 환경설정정보를 가져온다.   $ cf create-service p-mysql 100mb mysql-service-instance |

* 생성된 MySQL 서비스 인스턴스를 확인한다.

|  |
| --- |
| $ cf services |

## ***Sample Web App에 서비스 바인드 신청 및 App 확인***

서비스 신청이 완료되었으면 Sample Web App 에서는 생성된 서비스 인스턴스를 Bind 하여 App에서 MySQL 서비스를 이용한다.

\*참고: 서비스 Bind 신청시 개방형 클라우드 플랫폼에서 서비스 Bind 신청 할 수 있는 사용자로 로그인이 되어 있어야 한다.

* Sample Web App 디렉토리로 이동하여 manifest 파일을 확인한다.

|  |
| --- |
| $ cd hello-spring-mysql  $ vi manifest.yml  ---  applications:  - name: hello-tomcat-mysql #배포할 App 이름  memory: 512M # 배포시 메모리 사이즈  instances: 1 # 배포 인스턴스 수  path: target/hello-spring-mysql-1.0.0-BUILD-SNAPSHOT.war #배포하는 App 파일 PATH  참고: target/hello-spring-mysql-1.0.0-BUILD-SNAPSHOT.war 파일이 존재 하지 않을 경우 mvn 빌드를 수행 하면 파일이 생성된다. |

* --no-start 옵션으로 App을 배포한다.

--no-start: App 배포시 구동은 하지 않는다.

|  |
| --- |
| $ cf push --no-start |

* 배포된 Sample App을 확인하고 로그를 수행한다.

|  |
| --- |
| $ cf apps    $ cf logs {배포된 App명}  $ cf logs hello-tomcat-mysql |

* Sample Web App에서 생성한 서비스 인스턴스 바인드 신청을 한다.

|  |
| --- |
| $ cf bind-service hello-tomcat-mysql mysql-service-instance |

* 바인드가 적용되기 위해서 App을 재기동한다.

|  |
| --- |
| $ cf restart hello-tomcat-mysql |

* (참고) 바인드 후 App구동시 Mysql 서비스 접속 에러로 App 구동이 안될 경우 보안 그룹을 추가한다.

|  |
| --- |
| * rule.json 화일을 만들고 아래와 같이 내용을 넣는다.   $ vi rule.json  [  {  "protocol": "tcp",  "destination": "10.244.7.6",  "ports": "3306"  }  ]   * 보안 그룹을 생성한다.   $ cf create-security-group p-mysql rule.json     * 모든 App에 Mysql 서비스를 사용할수 있도록 생성한 보안 그룹을 적용한다.   $ cf bind-running-security-group p-mysql     * App을 리부팅 한다.   $ cf restart hello-tomcat-mysql |

* App이 정상적으로 MySQL 서비스를 사용하는지 확인한다.

|  |
| --- |
| * curl 로 확인   $ curl hello-tomcat-mysql.10.244.0.34.xip.io |

1. 변경 내용: 변경이 발생되는 위치와 변경 내용을 자세히 기록(장/절과 변경 내용을 기술한다.) [↑](#footnote-ref-1)
2. YAML Ain’t Markup Language, http://www.yaml.org, http://ko.wikipedia.org/wiki/YAML [↑](#footnote-ref-2)
3. BOSH가 Stemcell로부터 복사된 VM을 제어할 수 있도록 BOSH Agent가 내장되어 있는데 이를 “Stemcell”이라 부른다. [↑](#footnote-ref-3)
4. Release는 시스템에서 설치될 구성 및 소프트웨어들을 포함한다. [↑](#footnote-ref-4)