手把手教你玩转小米MINOS

小米科技 武泽胜

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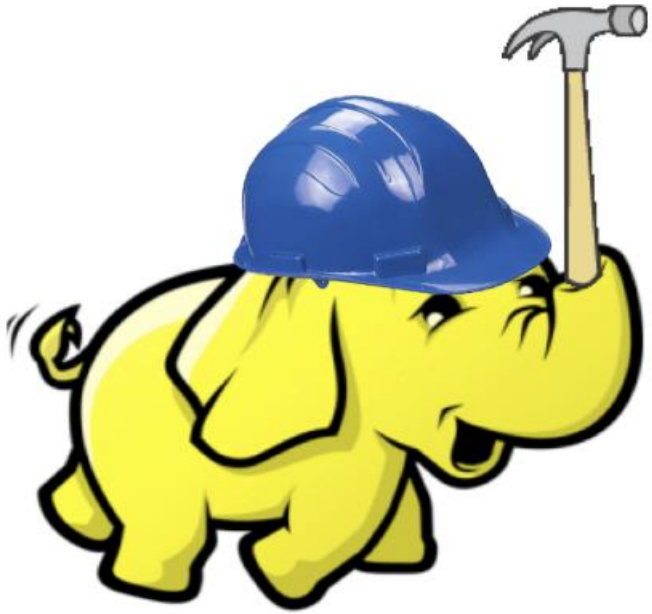
Part 1: Minos简介

Minos简介

- 目标
  - 集群级别的Hadoop配置、布署、监控系统



Minos简介

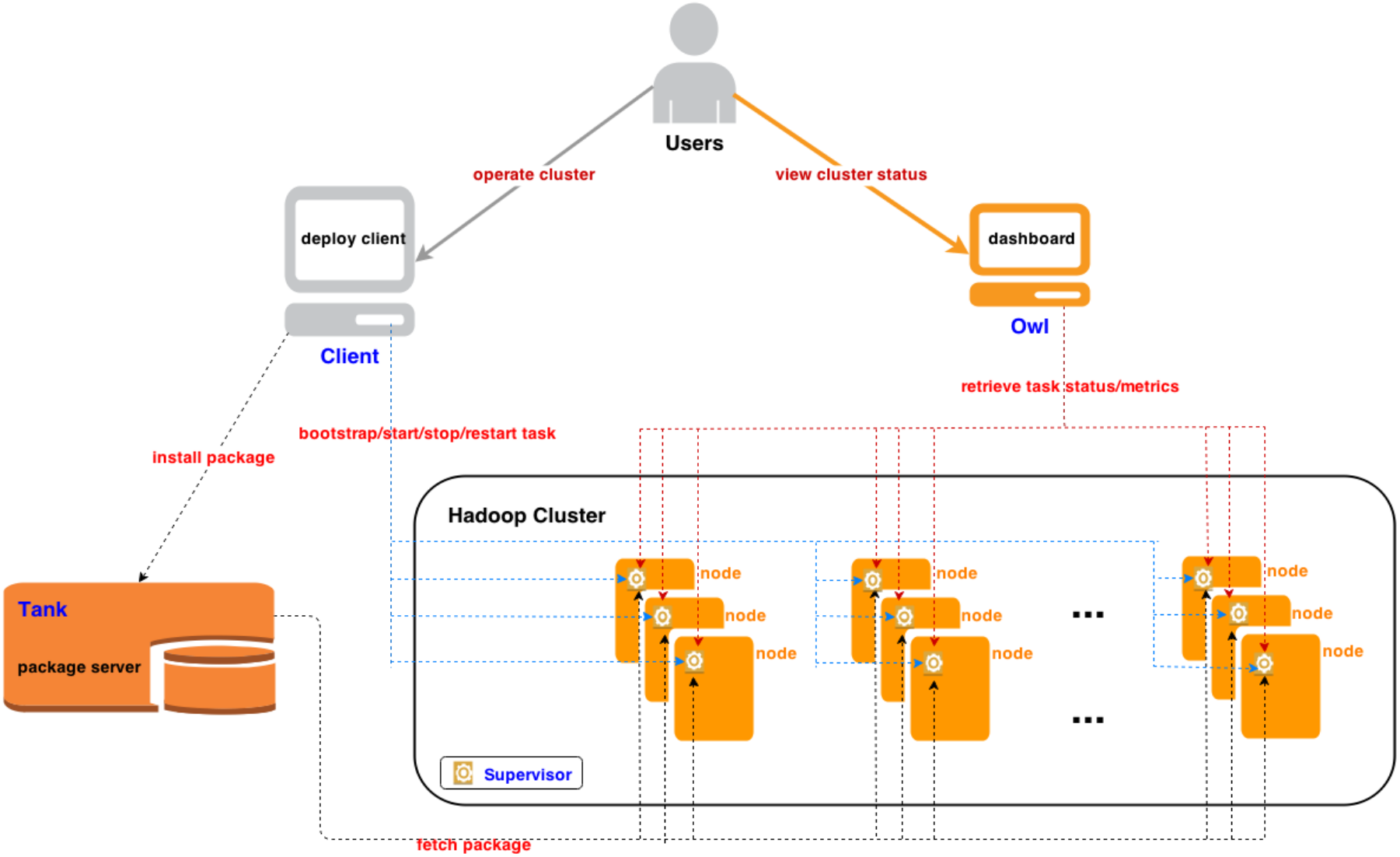
- 参考方案
  - Hadoop原生脚本
    - 大部分是进程级管理
    - 很多手工工作，不自动，无状态监控
  - Cloudera Manager
    - http://www.cloudera.com/content/cloudera/en/products/cloudera-manager.html
    - Cloudera商业软件，免费版: 50 nodes; 收费版: 高级feature, support
    - 安装为系统服务，难支持同机多实例
    - 比较黑盒，不方便定位错误
    - 为Hadoop Ecosystem定制，扩展支持其它服务的门槛相对比较高
    - 缺乏灵活的包版本管理，方便用官方发布包，不方便开发团队
    - 不支持metrics收集与展示
  - Apache Ambari
    - http://incubator.apache.org/ambari/
    - 由Hortonworks主导，免费、开源
    - 与Cloudera Manager 3/4/5/6类似的特点
    - 布署依赖ssh，需要用public key做无密码登录
    - Metrics通过Ganglia支持，Monitor通过Nagios支持
  - 大厂通用方案
    - Microsoft’s Autopilot, Google’s Borg, Tencent’s Torca

Minos简介

- Minos
  1. https://github.com/XiaoMi/minos
  2. 由小米大数据团队自主研发，免费、开源
  3. 不强制要求布署为系统服务，能够灵活支持同机多实例
  4. 灵活便捷的包管理，对开发团队更为友好
  5. 直观的WebUI Dashboard，方便的Command Line Tool
  6. 抽象出service/job/task的概念，直观的配置文件描述
  7. 既支持集群级别的管理，也支持指定job/task级别的管理
  8. 支持一键安装，方便用户使用
  9. 方便扩展支持其它服务: Minos is beyond a hadoop deployment system!

Part 2: 原理篇

Minos架构

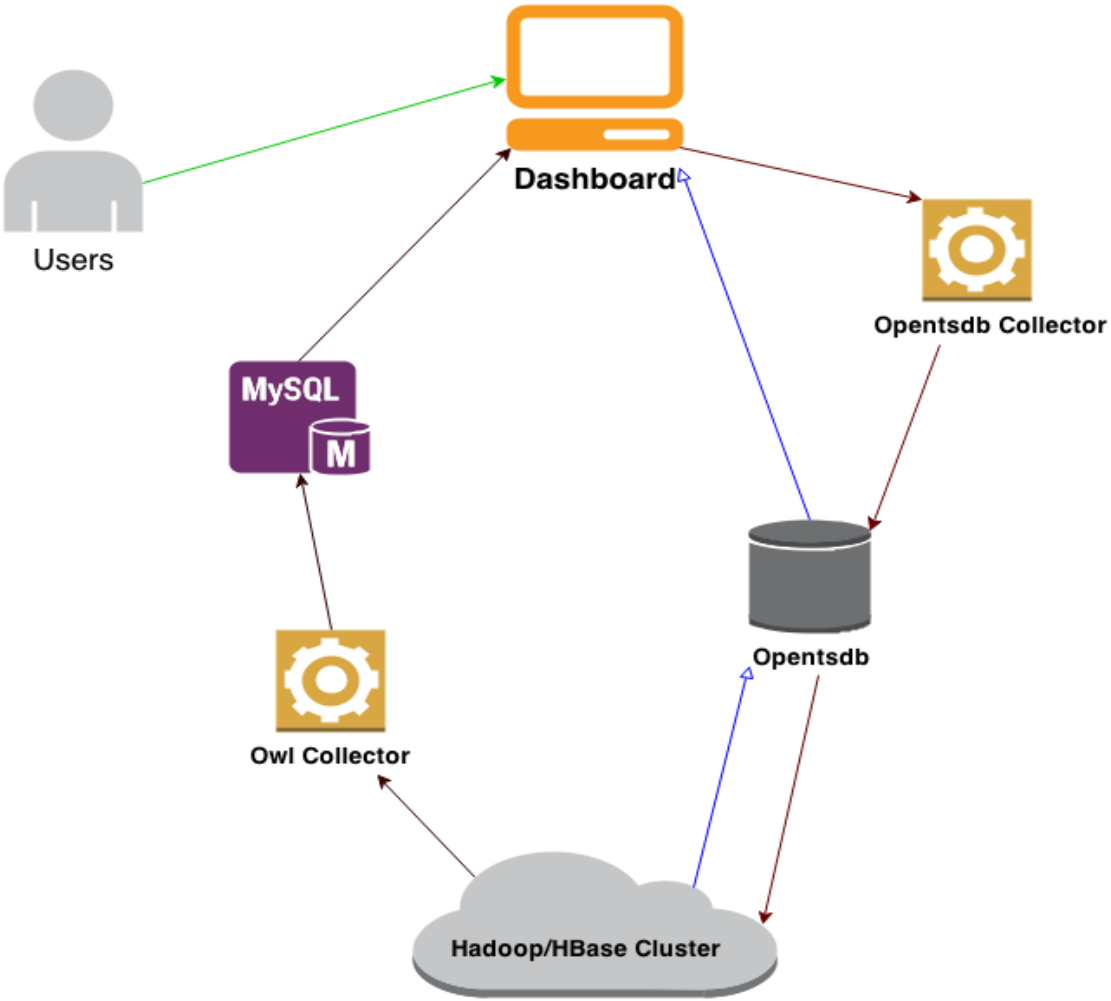

Users
operate cluster
view cluster status
deploy client
dashboard
Client
Owl
retrieve task status/metrics
bootstrap/start/stop/restart task
install package
Hadoop Cluster
node
Tank
package server
Supervisor
fetch package

Minos组件

- Client
  - 命令行工具，集群管理入口
- Tank
  - 包管理服务器
  - Revision No, Timestamp, Package Name唯一标识Package
- Supervisor
  - 进程管理与监控服务器
  - 基于开源的Supervisor(http://supervisord.org/)二次开发
  - 通过xmlrpc通信，不再依赖ssh
- Owl
  - Metrics收集，存储，展示
  - 存储基于Opentsdb(http://opentsdb.net/)，具有强大的线型扩展性

Minos组件

- Owl架构



Part 3: 实践篇

构建Minos

- Prerequisites
  - Python 2.7 http://www.python.org
  - JDK 1.6 http://www.oracle.com/technetwork/java/javase/downloads/index.html
- Clone the Minos Repository
  - git clone https://github.com/XiaoMi/minos.git
- Building the virtual environment

```
[work@wcc-hadoop-st01 minos]$ ./build.sh build
Creating virtual environment at /home/work/minos/build/env
New python executable in /home/work/minos/build/env/bin/python
Installing setuptools.............done.
/home/work/minos/build/env ready
2014-02-07 15:49:29 Check and install prerequisite python libraries.
2014-02-07 15:49:29 Installing configobj
Downloading/unpacking configobj==4.7.2
  Downloading configobj-4.7.2.tar.gz
  Running setup.py egg_info for package configobj

Installing collected packages: configobj
  Running setup.py install for configobj

Successfully installed configobj
Cleaning up...
2014-02-07 15:49:32 Minos client has been built.
[work@wcc-hadoop-st01 minos]$
```

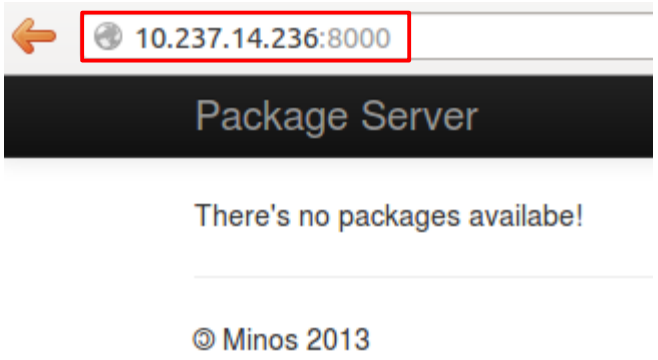
布署Tank

- Start Tank

```
[work@wcc-hadoop-st01 minos]$ ./build.sh start tank --tank_ip 10.237.14.236 --tank_port 8000
2014-02-07 15:53:59 Building tank server.
2014-02-07 15:53:59 Check and install prerequisite python libraries.
2014-02-07 15:53:59 Installing django
Downloading/unpacking django==1.6.1
  Downloading Django-1.6.1.tar.gz (6.6MB): 6.6MB downloaded
  Running setup.py egg_info for package django

    warning: no previously-included files matching '__pycache__' found under directory '*'
    warning: no previously-included files matching '*.py[co]' found under directory '*'
Installing collected packages: django
  Running setup.py install for django
    changing mode of build/scripts-2.7/django-admin.py from 664 to 775

    warning: no previously-included files matching '__pycache__' found under directory '*'
    warning: no previously-included files matching '*.py[co]' found under directory '*'
    changing mode of /home/work/minos/build/env/bin/django-admin.py to 775
Successfully installed django
Cleaning up...
2014-02-07 15:55:58 The component tank has been built successfully.
2014-02-07 15:55:58 Starting tank server
Creating tables ...
Creating table package_server_package
Installing custom SQL ...
Installing indexes ...
Installed 0 object(s) from 0 fixture(s)
```

布署Tank

- Tank Web



- Stop Tank

```
[work@wcc-hadoop-st01 minos]$ ./build.sh stop tank
2014-02-08 10:54:27 Stopping tank server
```

布署Supervisor

- 修改Supervisor默认配置

```
[work@wcc-hadoop-st01 ~]$ cd minos/build/template/
[work@wcc-hadoop-st01 template]$ vi supervisord.conf.tmpl
```

```
[inet_http_server]         ; inet (TCP) server disabled by default
port=0.0.0.0:9001          ; (ip_address:port specifier, *:port for al
username=minosuser         ; (default is no username (open server))
password=123456            ; (default is no password (open server))
```

Supervisor webserver 默认用户名、密码及ip/port

布署Supervisor

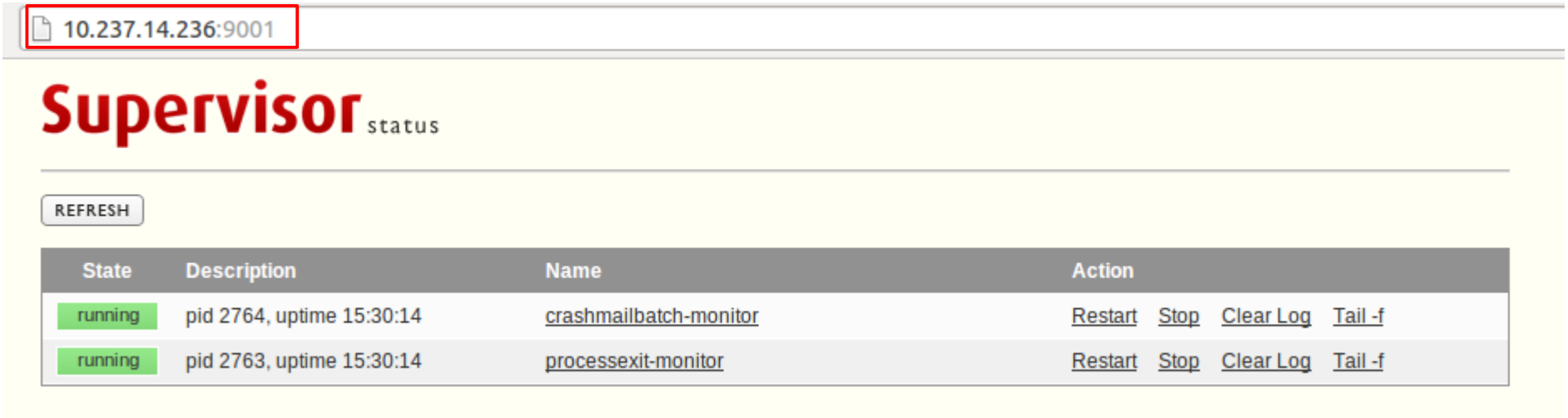
- Prerequisites
  - 布署并启动Tank
- Run Supervisor

```
[work@wcc-hadoop-st01 minos]$ ./build.sh start supervisor --tank ip 10.237.14.236 --tank port 8000
2014-02-07 16:09:43 Building supervisor
2014-02-07 16:09:43 Check and install prerequisite python libraries.
2014-02-07 16:09:43 Installing meld3
Downloading/unpacking meld3==0.6.10
  Downloading meld3-0.6.10.tar.gz (41kB): 41kB downloaded
  Running setup.py egg_info for package meld3

Installing collected packages: meld3
  Running setup.py install for meld3

Successfully installed meld3
Cleaning up...
2014-02-07 16:09:46 Installing elementtree
Downloading/unpacking elementtree==1.2.6-20050316
  You are installing a potentially insecure and unverifiable file. Future versions of pip will defa
re files.
  Downloading elementtree-1.2.6-20050316.tar.gz (41kB): 41kB downloaded
  Running setup.py egg_info for package elementtree

Installing collected packages: elementtree
  Running setup.py install for elementtree

Successfully installed elementtree
Cleaning up...
2014-02-07 16:09:49 Installing pexpect
Downloading/unpacking pexpect==3.0
  Downloading pexpect-3.0.tar.gz (146kB): 146kB downloaded
  Running setup.py egg_info for package pexpect

Installing collected packages: pexpect
  Running setup.py install for pexpect

Successfully installed pexpect
Cleaning up...
Please input the path for deploying services:
[if you want to use the default path: /home/work, press Enter.]
:
2014-02-07 16:10:12 Creating the app root /home/work/app
2014-02-07 16:10:12 Creating the log root /home/work/log
2014-02-07 16:10:12 Creating the packages root /home/work/packages
2014-02-07 16:10:12 Deploying supervisor in /home/work/minos/supervisor
2014-02-07 16:10:12 The component supervisor has been built successfully.
2014-02-07 16:10:12 Starting supervisor
[work@wcc-hadoop-st01 minos]$
```

Hadoop cluster布署的位置
默认：当前用户家目录

布署Supervisor

- 查看Supervisor Web



- Stop Supervisor

```
[work@wcc-hadoop-st01 minos]$ ./build.sh stop supervisor
2014-02-08 11:20:17 Stopping supervisor
tcp        0      0 0.0.0.0:9001                0.0.0.0:*                   LISTEN      2751/python
Wait for supervisor exiting...
```

Using Client

集群布署准备

- 基本约定
  - 集群命名
    - 集群类型: serving -> srv, processing -> prc, testing -> tst
    - Zookeeper cluster: dptst (idc + type)
    - Other cluster: dptst-example (zk + business)
  - 配置文件命名
    - zookeeper-dptst.cfg
    - hdfs-dptst-miliao.cfg
    - hbase-dptst-miliao.cfg
  - 配置文件结构

```
hdfs/
├── common
│   ├── hdfs-common.cfg
│   ├── hdfs-prc-common.cfg
│   ├── hdfs-srv-common.cfg
│   └── hdfs-tst-common.cfg
└── hdfs-dptst-example.cfg
zookeeper/
├── common
│   └── zookeeper-common.cfg
└── zookeeper-dptst.cfg
```

集群布署准备

- 应用程序包准备
  - ZooKeeper
    - zookeeper-3.4.4
    - mvn clean package –Pdist –Dtar -DskipTests
  - HDFS
    - hadoop-2.0.0-cdh4.1.0
    - mvn clean package –Pdist –Dtar -DskipTests
  - HBase
    - hbase-0.94.3
    - mvn clean package –Dtar -DskipTests

集群布署准备

- Minos配置
  - 在作为Client端的机器上打开配置文件deploy.cfg

```
>cd minos/
yongxing@wcc-hadoop-st01.bj ~/infra/minos $
>vi deploy.cfg
```

  - 修改supervisor和tank相应的配置

```
15 [supervisor]
16 ; The supervisord server port
17 server_port=9001
18
19 ; The supervisord username
20 user=minosuser
21
22 ; The supervisord user's password
23 password=123456
24
25 [tank]
26 ; The package server host
27 server_host=10.237.14.236
28
29 ; The package server port
30 server_port=8000
```

布署Zookeeper

- Zookeeper配置

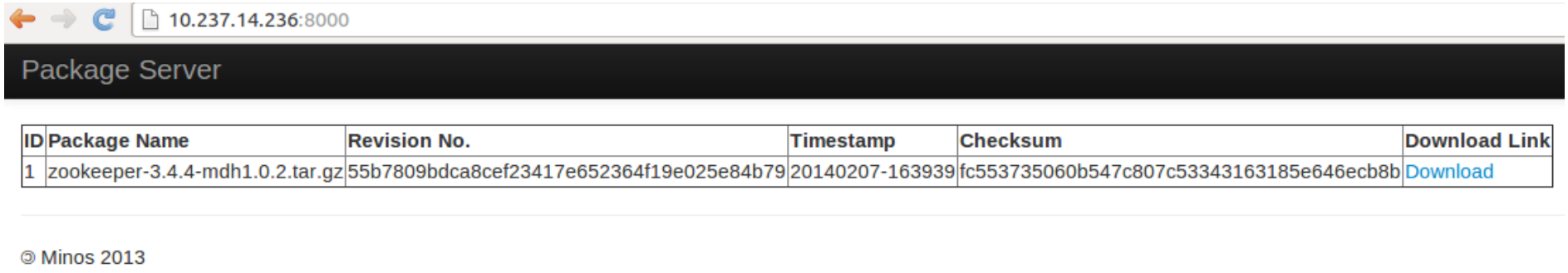
```
>cd config/conf/zookeeper/
yongxing@wcc-hadoop-st01.bj
>vi zookeeper-dptst.cfg
```

```
# deployment config for ZooKeeper

[cluster]
  # the cluster name could contain only lower case letters or numbers, and
  # consistent to the config file name.
  name=dptst

  # version of maven artifact.
  version=3.4.4-mdh1.0.2

  # all jobs below to this cluster, if more than one, separated by space.
  # each job has one section with the job name, as below.
  jobs=zookeeper

  kerberos_username=""
  kerberos_realm=EXAMPLE.HADOOP

  # the ganglia server address used to report metrics
  ganglia_address=10.235.2.215:8699

  # the global log level to be configured
  log_level=info

[zookeeper]
  # common params for all kinds of job:

  # zk service ports are start from base_port
  # Client port is base_port
  # Follower port is base_port + 2
  # Leader election port is base_port + 3
  # the base port must be a multiple of 100
  base_port=12000

  # list all hosts here, must be IP, the id must be a non-negative integer
  # not necessary continuously.
  host.0=10.237.14.236
  host.1=10.237.101.56
  host.2=10.237.101.59

  [[arguments]]
    jvm_args='''
      -Xmx1024m
      -Xms1024m
      -Xmn512m
      -XX:MaxDirectMemorySize=1024m
      -XX:MaxPermSize=128m
    '''

# configuration for zookeeper
[configuration]
  # The configuration section is inherited from the base config file
  base=%{config_dir}/conf/zookeeper/common/zookeeper-common.cfg
```

布署ZooKeeper

- 布署Zookeeper服务
  - Install

```
>./deploy.sh install zookeeper dptst
2014-02-07 16:39:38 Installing zookeeper to package server
2014-02-07 16:39:38 Uploading pacakge: /home/yongxing/infra/zookeeper/build/zookeeper-3.4.4-mdh1.0.2.tar.gz
2014-02-07 16:39:38 Revision is: 55b7809bdca8cef23417e652364f19e025e84b79
2014-02-07 16:39:38 Generating checksum of package: /home/yongxing/infra/zookeeper/build/zookeeper-3.4.4-mdh1.0.2.tar.gz
2014-02-07 16:39:38 Checksum is: fc553735060b547c807c53343163185e646ecb8b
2014-02-07 16:39:39 Upload package /home/yongxing/infra/zookeeper/build/zookeeper-3.4.4-mdh1.0.2.tar.gz success
2014-02-07 16:39:39 Install zookeeper to package server success
{'artifact': 'zookeeper',
 'checksum': 'fc553735060b547c807c53343163185e646ecb8b',
 'package_name': 'zookeeper-3.4.4-mdh1.0.2.tar.gz',
 'revision': '55b7809bdca8cef23417e652364f19e025e84b79',
 'timestamp': '20140207-163939'}
```



布署ZooKeeper

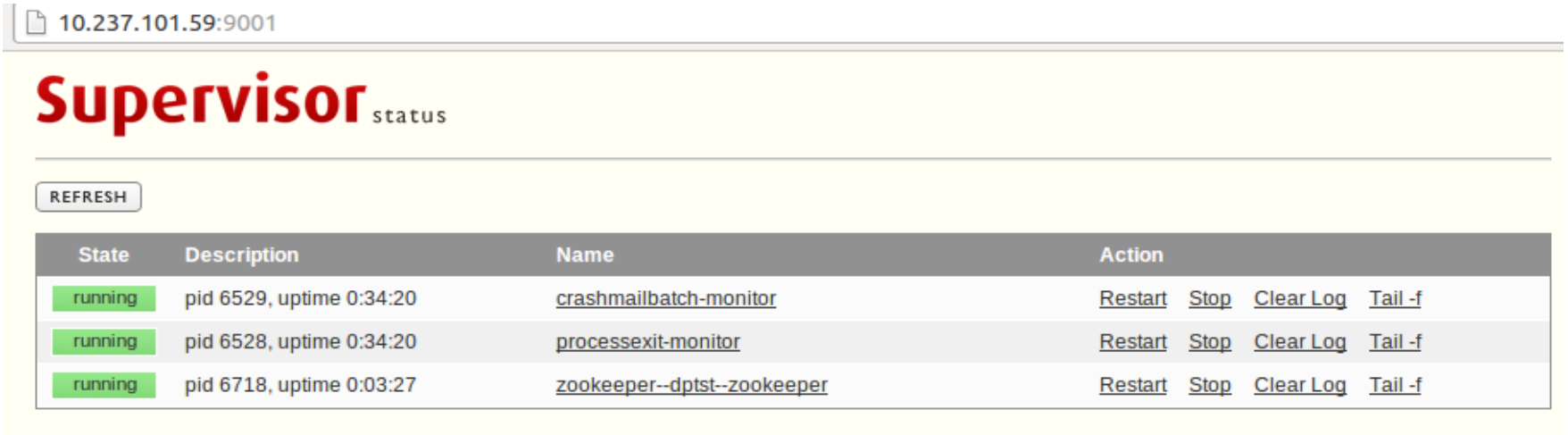
- 布署Zookeeper服务
  - Bootstrap

```
>./deploy.sh bootstrap zookeeper dptst
2014-02-07 16:46:03 You should set a bootstrap password, it will be requried when you do cleanup
Set a password manually? (y/n) y
Please input your password:
2014-02-07 16:46:08 Your password is: dptst-example, you should store this in a safe place, becaus
 code used to do cleanup
2014-02-07 16:46:08 Bootstrapping task 0 of zookeeper on 10.237.14.236(0)
2014-02-07 16:46:09 Bootstrap task 0 of zookeeper on 10.237.14.236(0) success
2014-02-07 16:46:09 Starting task 0 of zookeeper on 10.237.14.236(0)
2014-02-07 16:46:09 Start task 0 of zookeeper on 10.237.14.236(0) success
2014-02-07 16:46:09 Bootstrapping task 1 of zookeeper on 10.237.101.56(0)
2014-02-07 16:46:09 Bootstrap task 1 of zookeeper on 10.237.101.56(0) success
2014-02-07 16:46:09 Starting task 1 of zookeeper on 10.237.101.56(0)
2014-02-07 16:46:09 Start task 1 of zookeeper on 10.237.101.56(0) success
2014-02-07 16:46:09 Bootstrapping task 2 of zookeeper on 10.237.101.59(0)
2014-02-07 16:46:11 Bootstrap task 2 of zookeeper on 10.237.101.59(0) success
2014-02-07 16:46:11 Starting task 2 of zookeeper on 10.237.101.59(0)
2014-02-07 16:46:11 Start task 2 of zookeeper on 10.237.101.59(0) success
```

布署ZooKeeper

- 布署Zookeeper服务
  - Show

```
>./deploy.sh show zookeeper dptst
2014-02-07 16:46:17 Showing task 0 of zookeeper on 10.237.14.236(0)
2014-02-07 16:46:17 Task 0 of zookeeper on 10.237.14.236(0) is RUNNING
2014-02-07 16:46:17 Showing task 1 of zookeeper on 10.237.101.56(0)
2014-02-07 16:46:17 Task 1 of zookeeper on 10.237.101.56(0) is RUNNING
2014-02-07 16:46:17 Showing task 2 of zookeeper on 10.237.101.59(0)
2014-02-07 16:46:17 Task 2 of zookeeper on 10.237.101.59(0) is RUNNING
```



布署ZooKeeper

- 命令使用总结
  - Pattern: ./deploy.sh $command $service $cluster
  - Example: ./deploy.sh install zookeeper dptst
  - Supported Commands:
    - ✓ Install: 将程序包安装到Tank服务器
    - ✓ Bootstrap: 初始化程序运行环境，并启动程序(只需要在第一次布署时执行)
    - ✓ Show: 查看程序运行状态
    - ✓ Start: 启动程序
    - ✓ Stop: 停止程序
    - ✓ Restart: 重启程序
    - ✓ Cleanup: 清理程序运行环境，包括集群中的数据(危险操作，只对确定不再需要的集群做此操作)
    - ✓ Rolling_update: 逐台更新程序
    - ✓ Pack: 将程序和配置文件打包，方便用户使用
    - ✓ Shell: 通过命令行客户端操作集群的入口

布署HDFS

- 配置HDFS
  - 修改$minos/config/conf/hdfs/hdfs-dptst-example.cfg, 对HDFS进行配置
- 安装、启动HDFS
  - cd $minos/client
  - ./deploy.sh install hdfs dptst-example
  - ./deploy.sh bootstrap hdfs dptst-example

布署HDFS

- 查看HDFS运行状态

```
>./deploy.sh show hdfs dptst-example
2014-02-07 17:17:52 Showing task 0 of journalnode on 10.237.14.236(0)
2014-02-07 17:17:52 Task 0 of journalnode on 10.237.14.236(0) is RUNNING
2014-02-07 17:17:52 Showing task 1 of journalnode on 10.237.101.56(0)
2014-02-07 17:17:52 Task 1 of journalnode on 10.237.101.56(0) is RUNNING
2014-02-07 17:17:52 Showing task 2 of journalnode on 10.237.101.59(0)
2014-02-07 17:17:52 Task 2 of journalnode on 10.237.101.59(0) is RUNNING
2014-02-07 17:17:52 Showing task 0 of zkfc on 10.237.14.236(0)
2014-02-07 17:17:52 Task 0 of zkfc on 10.237.14.236(0) is RUNNING
2014-02-07 17:17:52 Showing task 1 of zkfc on 10.237.101.56(0)
2014-02-07 17:17:52 Task 1 of zkfc on 10.237.101.56(0) is RUNNING
2014-02-07 17:17:52 Showing task 0 of namenode on 10.237.14.236(0)
2014-02-07 17:17:52 Task 0 of namenode on 10.237.14.236(0) is RUNNING
2014-02-07 17:17:52 Showing task 1 of namenode on 10.237.101.56(0)
2014-02-07 17:17:52 Task 1 of namenode on 10.237.101.56(0) is RUNNING
2014-02-07 17:17:52 Showing task 0 of datanode on 10.237.14.236(0)
2014-02-07 17:17:52 Task 0 of datanode on 10.237.14.236(0) is RUNNING
2014-02-07 17:17:52 Showing task 1 of datanode on 10.237.101.56(0)
2014-02-07 17:17:52 Task 1 of datanode on 10.237.101.56(0) is RUNNING
2014-02-07 17:17:52 Showing task 2 of datanode on 10.237.101.59(0)
2014-02-07 17:17:52 Task 2 of datanode on 10.237.101.59(0) is RUNNING
```

布署HDFS

- 通过Shell操作HDFS

```
>./deploy.sh shell hdfs dptst-example
help            print this help information
dfsadmin        run a DFS admin client
oev             apply the offline edits viewer to an edits file
balancer        run a cluster balancing utility
fsck            run a DFS filesystem checking utility
groups          get the groups which users belong to
fetchdt         fetch a delegation token from the NameNode
oiv             apply the offline fsimage viewer to an fsimage
jmxget          get JMX exported values from NameNode or DataNode
dfs             run a filesystem command on the file systems supported in Hadoop
haadmin         run a DFS HA admin client
getconf         get config values from configuration
yongxing@wcc-hadoop-st01.bj ~/infra/minos/client $ date:Fri 07 Feb 2014 05:20:28 PM
>./deploy.sh shell hdfs dptst-example fsck /
Connecting to namenode via http://10.237.14.236:12201
FSCK started by yongxing (auth:SIMPLE) from /10.237.14.236 for path / at Fri Feb 07
Status: HEALTHY
 Total size:    0 B
 Total dirs:    1
 Total files:   0
 Total blocks (validated):      0
 Minimally replicated blocks:   0
 Over-replicated blocks:        0
 Under-replicated blocks:       0
 Mis-replicated blocks:         0
 Default replication factor:    3
 Average block replication:     0.0
 Corrupt blocks:                0
 Missing replicas:              0
 Number of data-nodes:          3
 Number of racks:               1
FSCK ended at Fri Feb 07 17:20:38 CST 2014 in 10 milliseconds


The filesystem under path '/' is HEALTHY
```

布署HBase

- 配署Hbase

cd config/conf/hbase
vi hbase-dptst-example.cfg

```
[cluster]
  # cluster name, formnat is [zk_service_name]-[hbase_nam
  # The hbase name could contain only lower case letters
  # and must be consistent to the config file name.
  name=dptst-example

  # version of maven artifact.
  version=0.94.3-mdh1.1-SNAPSHOT

  # All jobs below to this cluster, if more than one, sep
  # Each job has one section with the job name, as below.
  jobs=master regionserver

  kerberos_username=hbase_tst
  kerberos_realm=EXAMPLE.HADOOP

  # The HDFS cluster on which the HBase cluster depends.
  hdfs_cluster=dptst-example

  # The global log level to be configured.
  log_level=info

[master]
  # Client port is base_port
  # HTTP port is base_port + 1
  # The base port must be a multiple of 100
  base_port=12500

  # list all hosts here, must be IP, the id must be a non
  # not necessary continuously.
  host.0=10.237.14.236
  host.1=10.237.101.59

  [[arguments]]
    jvm_args='''
      -Xmx1024m
      -Xms1024m
      -Xmn512m
      -XX:MaxDirectMemorySize=1024m
      -XX:MaxPermSize=128m
    '''

[regionserver]
  # Client port is base_port
  # HTTP port is base_port + 1
  base_port=12600

  # list all hosts here, must be IP or IP/INSTANCE_NUM, f
  # not necessary continuously.
  # The regionserver can support for multiple instances o
  host.0=10.237.14.236/2
  host.1=10.237.101.59
  host.2=10.237.101.17
```

多实例

布署HBase

- 安装、启动HBase
  - ./deploy.sh install hbase dptst-example
  - ./deploy.sh bootstrap hbase dptst-example
- 查看HBase运行状态
  - ./deploy.sh show hbase dptst-example

```
>cd client/
yongxing@wcc-hadoop-st01.bj ~/infra/minos/client $ date:Sat 08 Feb 2014 03
>./deploy.sh show hbase dptst-example
2014-02-08 15:07:12 Showing task 0 of regionserver on 10.237.14.236(0)
2014-02-08 15:07:12 Task 0 of regionserver on 10.237.14.236(0) is RUNNING
2014-02-08 15:07:12 Showing task 1 of regionserver on 10.237.14.236(1)
2014-02-08 15:07:12 Task 1 of regionserver on 10.237.14.236(1) is RUNNING
2014-02-08 15:07:12 Showing task 2 of regionserver on 10.237.101.59(0)
2014-02-08 15:07:12 Task 2 of regionserver on 10.237.101.59(0) is RUNNING
2014-02-08 15:07:12 Showing task 3 of regionserver on 10.237.101.17(0)
2014-02-08 15:07:12 Task 3 of regionserver on 10.237.101.17(0) is RUNNING
2014-02-08 15:07:12 Showing task 0 of master on 10.237.14.236(0)
2014-02-08 15:07:12 Task 0 of master on 10.237.14.236(0) is RUNNING
2014-02-08 15:07:12 Showing task 1 of master on 10.237.101.59(0)
2014-02-08 15:07:12 Task 1 of master on 10.237.101.59(0) is RUNNING
```

布署Owl

- Prerequisites
  - Gnuplot
    - Centos: sudo yum install gnuplot
    - Ubuntu: sudo apt-get install gnuplot
  - Mysql
    - Centos: yum install mysql-server mysql mysql-devel
    - Ubuntu:

      sudo apt-get install mysql-server

      sudo apt-get install mysql-client

- Attention
  - Owl需要布署在作为Client端的机器上(使用同一套配置文件)

布署Owl

- 配置Owl Collector

```
[work@wcc-hadoop-st01 minos]$ cd config/owl
[work@wcc-hadoop-st01 owl]$ vi collector.cfg
```

```
# collector config

[collector]
services=hdfs hbase
# Period to fetch/report metrics, in seconds.
period=10

[hdfs]
clusters=dptst-example
jobs=journalnode namenode datanode
# The jmx output of each bean is as following:
# {
#   "name" : "hadoop:service=RegionServer,name=Regio
#   "modelerType" : "org.apache.hadoop.hbase.regions
#   "tbl.YCSBTest.cf.test.blockCacheNumCached" : 0,
#   "tbl.YCSBTest.cf.test.compactionBlockReadCacheHi
#   ...
# Some metrics/values are from hjadoop/hbase and som
# environment, we specify a filter on jmx url to get
metric_url=/jmx?qry=Hadoop:*

[hbase]
clusters=dptst-example
jobs=master regionserver
metric_url=/jmx?qry=hadoop:*

[yarn]
#clusters=dptst-example
#jobs=resourcemanager nodemanager historyserver prox
#metric_url=/jmx?qry=Hadoop:*

[impala]
#clusters=dptst-example
#jobs=statestored impalad
#metric_url=/
#need_analyze=false
```

支持的服务支持

收集metrics的url

布署Owl

- 启动Owl

```
[work@wcc-hadoop-st01 minos]$ ./build.sh start owl --local_ip 10.237.14.236
2014-02-08 16:02:59 Building owl
2014-02-08 16:02:59 Check and install prerequisite python libraries.
Please choose mysql server you intend to use:
1: Use the local mysql server
2: Use a remote mysql server
1
Please enter mysql password of the root user:root
2014-02-08 16:03:04 Configuring mysql for owl in /home/work/minos/owl/owl/settings.py
Creating tables ...
Creating table auth_permission
Creating table auth_group_permissions
Creating table auth_group
Creating table auth_user_groups
Creating table auth_user_user_permissions
Creating table auth_user
Creating table django_content_type
Creating table django_session
Creating table django_site
Creating table django_admin_log
Creating table business_business
Creating table hbase_longhaul
Creating table monitor_service
Creating table monitor_cluster
Creating table monitor_job
Creating table monitor_task
Creating table monitor_hbasecluster
Creating table monitor_regionserver
Creating table monitor_table
Creating table monitor_region
Creating table monitor_counter
Creating table monitor_quota

You just installed Django's auth system, which means you don't have any superusers defined.
Would you like to create one now? (yes/no): yes
Username (leave blank to use 'work'): admin
Email address:
Password:
Password (again):
Superuser created successfully.
Installing custom SQL ...
Installing indexes ...
Installed 0 object(s) from 0 fixture(s)
```

选择mysql server 并输入root用户密码

自动配置mysql、创建django数据库

布署Owl

- 启动Owl

```
2014-02-08 15:46:12 Setup hbase in /home/work/minos/build/download
--2014-02-08 15:46:12--  http://www.apache.org/dist/hbase/hbase-0.94.14/hbase-0.94.14.tar.gz
Resolving www.apache.org... 140.211.11.131, 192.87.106.229, 2001:610:1:80bc:192:87:106:229
Connecting to www.apache.org|140.211.11.131|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 58436526 (56M) [application/x-gzip]
Saving to: “hbase-0.94.14.tar.gz”

100%[=======================================================================================>] 58,436,5

2014-02-08 15:59:48 (70.0 KB/s) - “hbase-0.94.14.tar.gz” saved [58436526/58436526]

2014-02-08 15:59:49 Modify hbase-site.xml in /home/work/minos/build/download/hbase-0.94.14/conf
2014-02-08 15:59:49 Starting hbase
```

自动布署单机hbase并启动

```
2014-02-08 16:03:18 Checkout opentsdb in /home/work/minos/build/download/opentsdb
Initialized empty Git repository in /home/work/minos/build/download/opentsdb/.git/
remote: Reusing existing pack: 4402, done.
remote: Total 4402 (delta 0), reused 0 (delta 0)
Receiving objects: 100% (4402/4402), 26.70 MiB | 53 KiB/s, done.
Resolving deltas: 100% (2894/2894), done.
2014-02-08 16:08:18 Compiling opentsdb in /home/work/minos/build/download/opentsdb
+ test -f configure
+ ./bootstrap
```

自动布署opentsdb

布署Owl

- 启动Owl

```
+ ../configure
checking for a BSD-compatible install... /usr/bin/install -c
checking whether build environment is sane... yes
checking for a thread-safe mkdir -p... /bin/mkdir -p
checking for gawk... gawk
checking whether make sets $(MAKE)... yes
checking for md5sum... /usr/bin/md5sum
checking for java... /opt/soft/jdk/bin/java
checking for javac... /opt/soft/jdk/bin/javac
checking for jar... /opt/soft/jdk/bin/jar
checking for gnuplot... /usr/bin/gnuplot
checking for javadoc... /opt/soft/jdk/bin/javadoc
checking for wget... /usr/bin/wget
checking for curl... /usr/bin/curl
configure: creating ./config.status
config.status: creating Makefile
config.status: creating opentsdb.spec
config.status: creating build-aux/fetchdep.sh
+ exec make
set dummy "http://opentsdb.googlecode.com/files" "third_party/hbase/asynchbase-1.4.1.jar"; shift;
@"
--2014-02-08 16:08:22--  http://opentsdb.googlecode.com/files/asynchbase-1.4.1.jar
Resolving opentsdb.googlecode.com... 74.125.128.82, 2404:6800:4005:c00::52
Connecting to opentsdb.googlecode.com|74.125.128.82|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 150953 (147K) [application/x-java-archive]
Saving to: “third_party/hbase/asynchbase-1.4.1.jar-t”

100%[=======================================================================================>] 150,953

2014-02-08 16:08:23 (292 KB/s) - “third_party/hbase/asynchbase-1.4.1.jar-t” saved [150953/150953]

set dummy "http://search.maven.org/remotecontent?filepath=com/google/guava/guava/13.0.1" "third_pa
"; shift; ./build-aux/fetchdep.sh "$@"
--2014-02-08 16:08:23--  http://search.maven.org/remotecontent?filepath=com/google/guava/guava/13.
Resolving search.maven.org... 207.223.241.72
Connecting to search.maven.org|207.223.241.72|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1891110 (1.8M) [application/java-archive]
Saving to: “third_party/guava/guava-13.0.1.jar-t”

45% [=================================>                                              ] 864,228
```

自动编译opentsdb并安装第三方依赖包
由于opentsdb依赖包较多
这部分的安装需要耗费一段时间

布署Owl

- 启动Owl

```
make[1]: Leaving directory `/home/work/minos/build/download/opentsdb/build'
2014-02-08 16:20:42 Creating hbase table for opentsdb in /home/work/minos/build/download/opentsdb
HBase Shell; enter 'help<RETURN>' for list of supported commands.
Type "exit<RETURN>" to leave the HBase Shell
Version 0.94.14, r1543222, Mon Nov 18 23:23:33 UTC 2013

create 'tsdb-uid',
  {NAME => 'id', COMPRESSION => 'NONE'},
  {NAME => 'name', COMPRESSION => 'NONE'}
0 row(s) in 0.5420 seconds


create 'tsdb',
  {NAME => 't', VERSIONS => 1, COMPRESSION => 'NONE', BLOOMFILTER => 'ROW'}
0 row(s) in 1.0820 seconds

2014-02-08 16:20:47 Starting opentsdb
2014-02-08 16:20:47 Configuring opentsdb collector in /home/work/minos/config/opentsdb/metrics_colle
2014-02-08 16:20:47 Configure owl config file: /home/work/minos/config/owl/owl_config.py
2014-02-08 16:20:47 The component owl has been built successfully.
2014-02-08 16:20:47 Starting owl collector
nohup: appending output to `nohup.out'
2014-02-08 16:20:47 Starting opentsdb collector
nohup: appending output to `nohup.out'
2014-02-08 16:20:48 Starting owl monitor
nohup: appending output to `nohup.out'
```

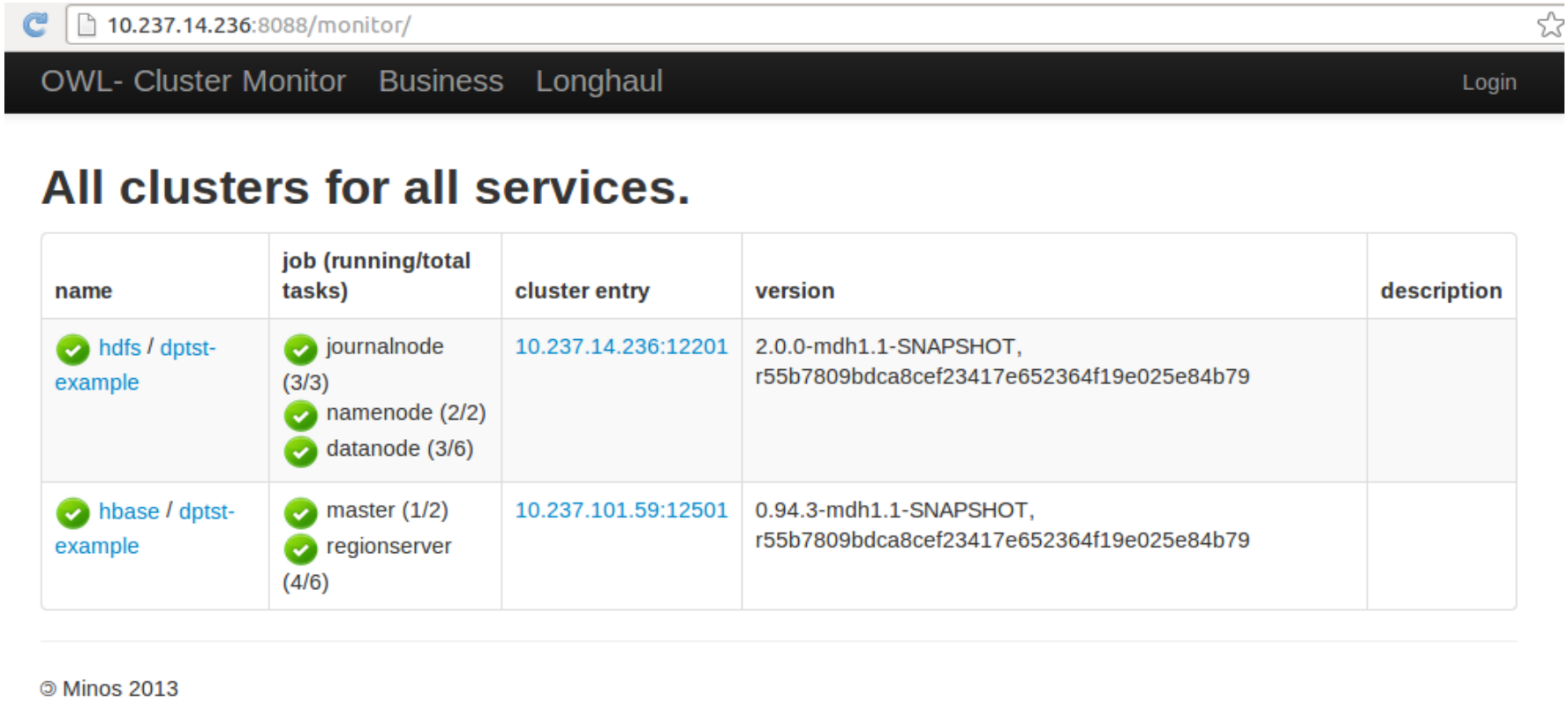
自动创建hbase表

owl布署成功

owl启动

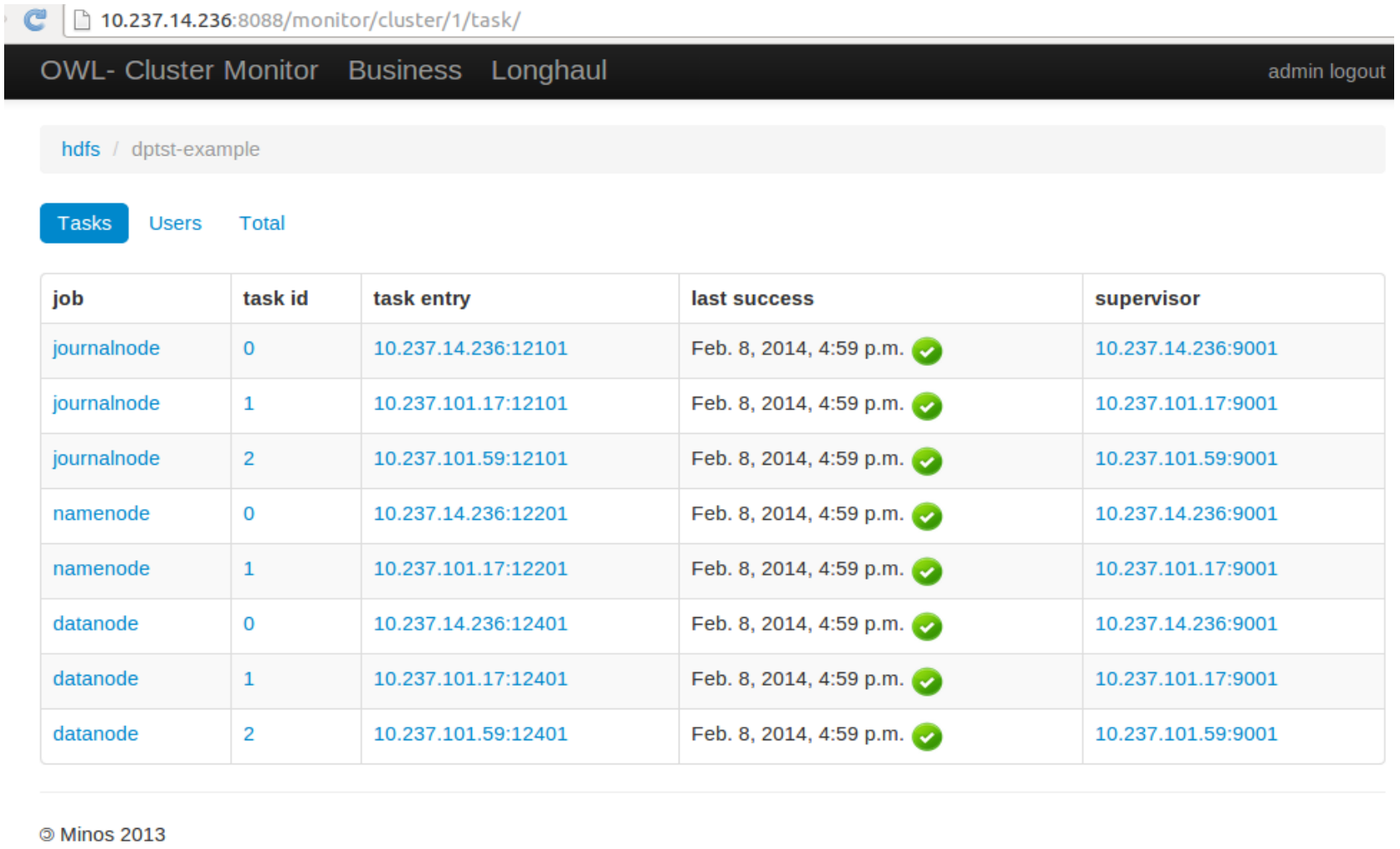
布署Owl

- 查看Owl


10.237.14.236:8088/monitor/
OWL- Cluster Monitor
Business
Longhaul
Login
All clusters for all services.
name
job (running/total tasks)
cluster entry
version
description
hdfs / dptst-example
journalnode (3/3)
namenode (2/2)
datanode (3/6)
10.237.14.236:12201
2.0.0-mdh1.1-SNAPSHOT, r55b7809bdca8cef23417e652364f19e025e84b79
hbase / dptst-example
master (1/2)
regionserver (4/6)
10.237.101.59:12501
0.94.3-mdh1.1-SNAPSHOT, r55b7809bdca8cef23417e652364f19e025e84b79
© Minos 2013

布署Owl

- 查看Owl


10.237.14.236:8088/monitor/cluster/1/task/
OWL- Cluster Monitor
Business
Longhaul
admin logout
hdfs / dptst-example
Tasks
Users
Total
job
task id
task entry
last success
supervisor
journalnode 0 10.237.14.236:12101 Feb. 8, 2014, 4:59 p.m. 10.237.14.236:9001
journalnode 1 10.237.101.17:12101 Feb. 8, 2014, 4:59 p.m. 10.237.101.17:9001
journalnode 2 10.237.101.59:12101 Feb. 8, 2014, 4:59 p.m. 10.237.101.59:9001
namenode 0 10.237.14.236:12201 Feb. 8, 2014, 4:59 p.m. 10.237.14.236:9001
namenode 1 10.237.101.17:12201 Feb. 8, 2014, 4:59 p.m. 10.237.101.17:9001
datanode 0 10.237.14.236:12401 Feb. 8, 2014, 4:59 p.m. 10.237.14.236:9001
datanode 1 10.237.101.17:12401 Feb. 8, 2014, 4:59 p.m. 10.237.101.17:9001
datanode 2 10.237.101.59:12401 Feb. 8, 2014, 4:59 p.m. 10.237.101.59:9001
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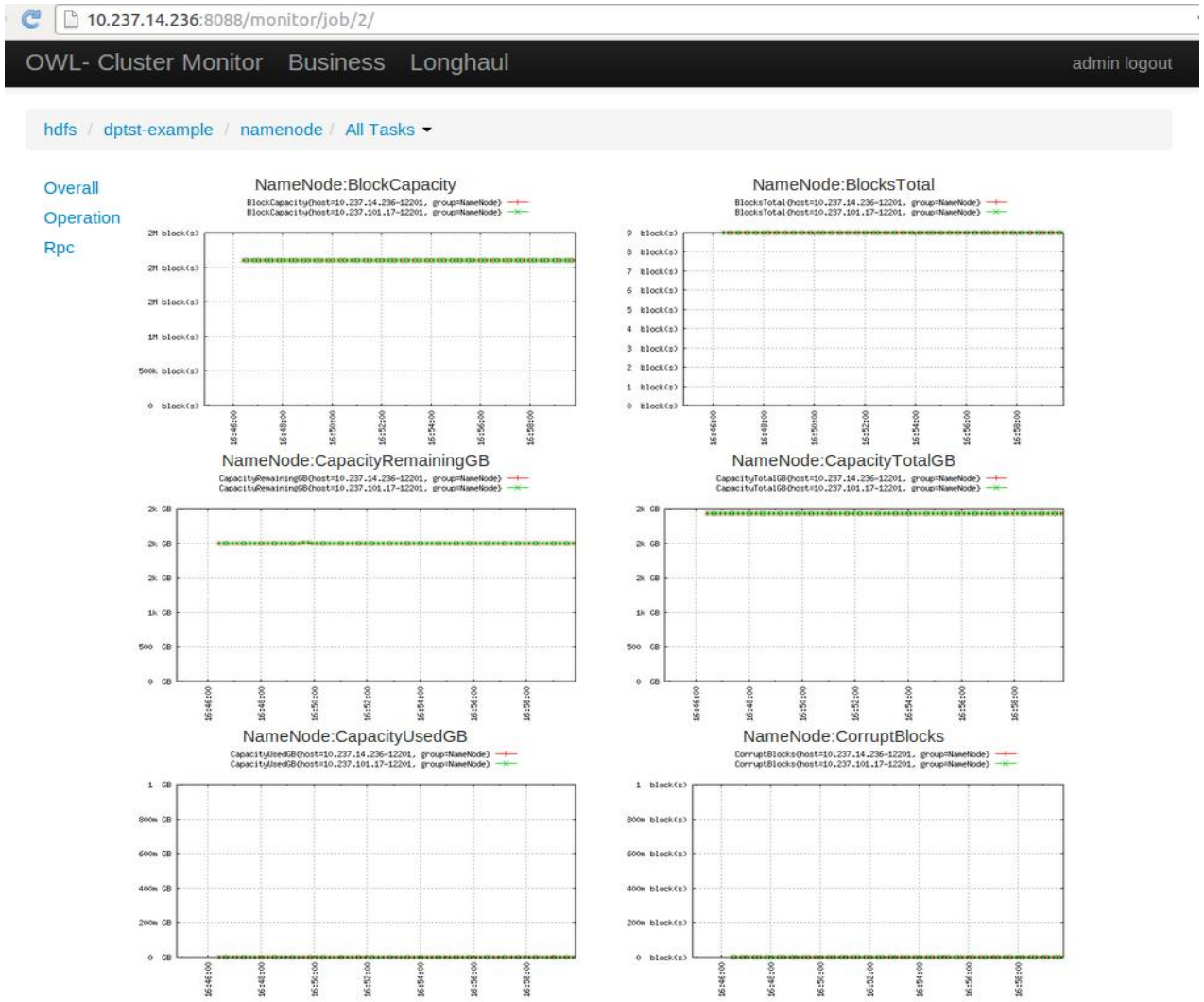
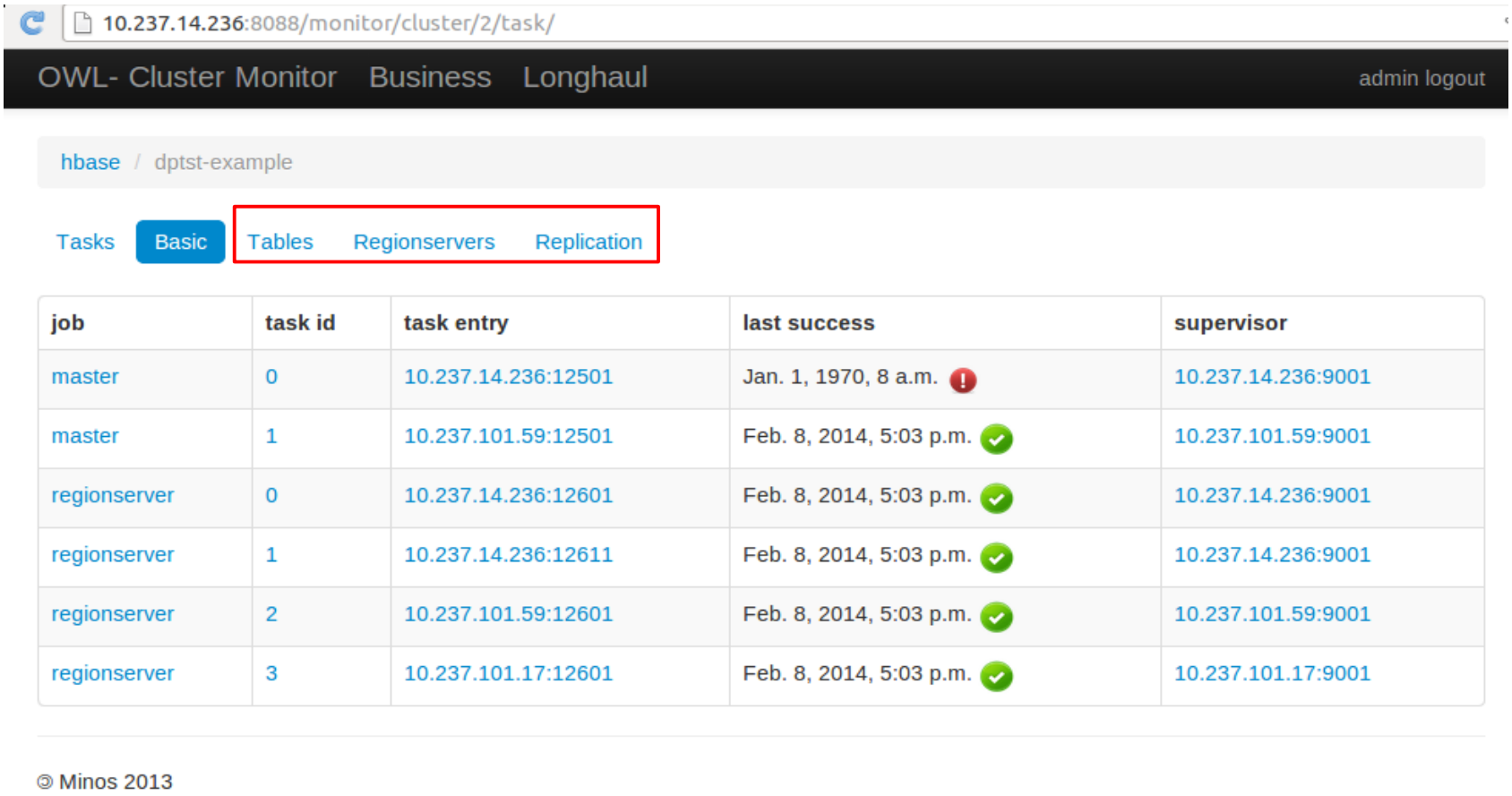
布署Owl

- 查看Owl


10.237.14.236:8088/monitor/job/2/
OWL- Cluster Monitor
Business
Longhaul
admin logout
hdfs / dptst-example / namenode / All Tasks
Overall
Operation
Rpc
NameNode:BlockCapacity
NameNode:BlocksTotal
NameNode:CapacityRemainingGB
NameNode:CapacityTotalGB
NameNode:CapacityUsedGB
NameNode:CorruptBlocks

布署Owl

- 查看Owl


10.237.14.236:8088/monitor/cluster/2/task/
OWL- Cluster Monitor
Business
Longhaul
admin logout
hbase / dptst-example
Tasks
Basic
Tables
Regionservers
Replication
job
task id
task entry
last success
supervisor
master
0
10.237.14.236:12501
Jan. 1, 1970, 8 a.m.
10.237.14.236:9001
master
1
10.237.101.59:12501
Feb. 8, 2014, 5:03 p.m.
10.237.101.59:9001
regionserver
0
10.237.14.236:12601
Feb. 8, 2014, 5:03 p.m.
10.237.14.236:9001
regionserver
1
10.237.14.236:12611
Feb. 8, 2014, 5:03 p.m.
10.237.14.236:9001
regionserver
2
10.237.101.59:12601
Feb. 8, 2014, 5:03 p.m.
10.237.101.59:9001
regionserver
3
10.237.101.17:12601
Feb. 8, 2014, 5:03 p.m.
10.237.101.17:9001
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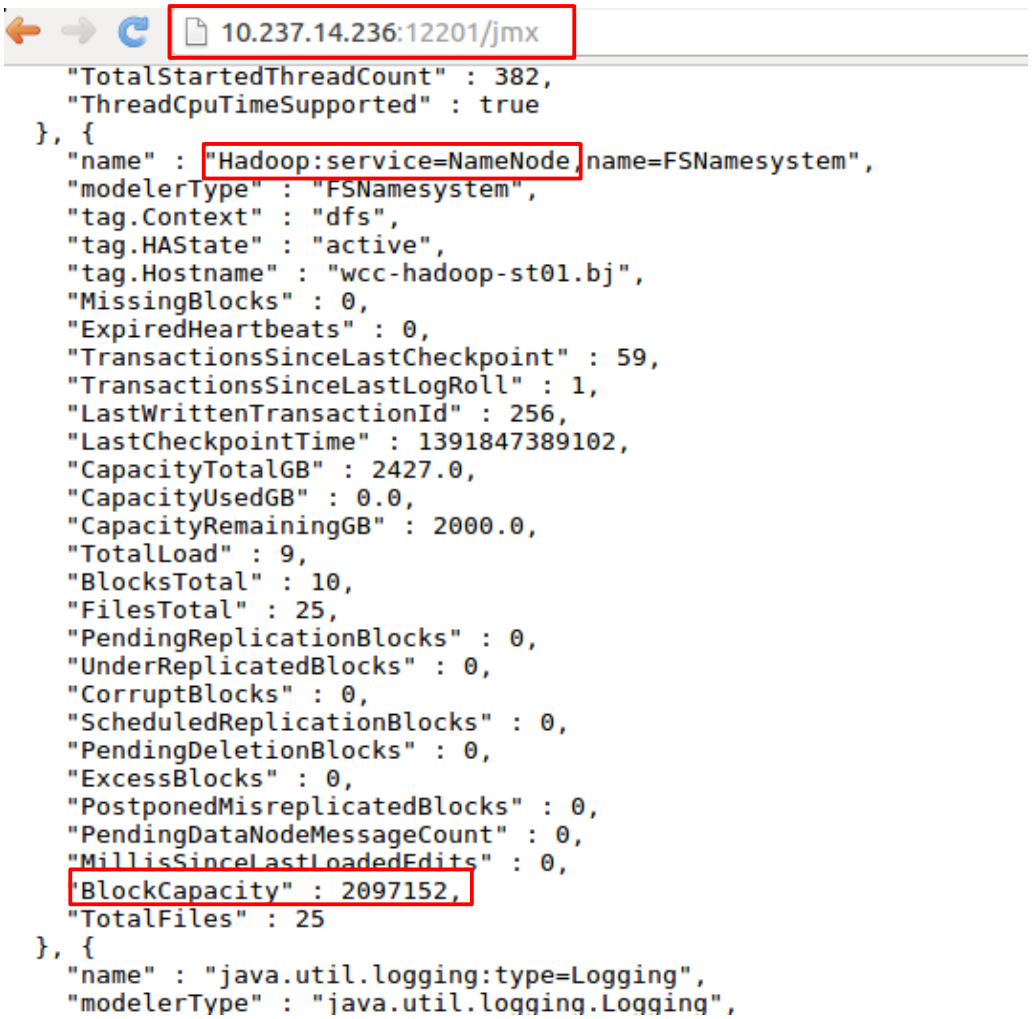
布署Owl

- 扩展metrics



Part 4: Minos Future

Minos Future

- 支持异构机型
- 端口动态分配
- Owl性能优化
- 多线程布署
- 支持远程操控集群机器Shell

Q & A

- Any Questions?
- Contact Me:
  - Mail: wuzesheng@xiaomi.com
  - Weibo: @wuzesheng