

# Cloud Computing – Assignment 2

**cmpe 297**

*Marcel Kutsch*

GitHub: <https://github.com/kutschm/CMPE297-Assignment2.git>

*Hello World → task 1*

*PageHit → non mapreduce implementation of click counter*

*PageHitMR – mapreduce implementation of click counter*

I used the hosted service with vmc to interact with Cloud Foundry

## 1) Hello World on Cloud Foundry

### Application deployment

```
mkutsch@mkutsch:~/Documents/SJSU/Semester_5/CMPE297/Assi2/HelloWorld$ vmc push
/usr/local/lib/ruby/1.9.1/yaml.rb:56:in `<top (required)>':
It seems your ruby installation is missing psych (for YAML output).
To eliminate this warning, please install libyaml and reinstall your ruby.
Name> cmpe297-kutschm-assignment2-HelloWorld

Instances> 1
1: sinatra
2: other
Framework> sinatra
Runtime> 2
Memory Limit> 128M

Creating cmpe297-kutschm-assignment2-HelloWorld... OK
1: cmpe297-kutschm-assignment2-HelloWorld.cloudfoundry.com
2: none
URL> cmpe297-kutschm-assignment2-HelloWorld.cloudfoundry.com

Updating cmpe297-kutschm-assignment2-HelloWorld... OK

Create services for application?> n

Bind other services to application?> n

Save configuration?> n

Uploading cmpe297-kutschm-assignment2-HelloWorld... OK
Starting cmpe297-kutschm-assignment2-HelloWorld... OK
Checking cmpe297-kutschm-assignment2-HelloWorld... OK

mkutsch@mkutsch:~/Documents/SJSU/Semester_5/CMPE297/Assi2/HelloWorld$ vmc apps

name                status  usage  runtime  url
cmpe297-kutschm-assignment2-HelloWorld  running  1 x 128M  ruby19  cmpe297-kutschm-assignment2-helloworld.cloudfoundry.com
mkutsch@mkutsch:~/Documents/SJSU/Semester_5/CMPE297/Assi2/HelloWorld$
```

In vmc 0.4.1 you can scale your application up and down using

`vmc scale cmpe297-kutschm-assignment2-HelloWorld`

```
mkutsch@mkutsch:~/Documents/SJSU/Semester_5/CMPE297/Assi2/HelloWorld$ vmc scale cmpe297-kutschm-assignment2-HelloWorld
/usr/local/lib/ruby/1.9.1/yaml.rb:56:in `<top (required)>':
It seems your ruby installation is missing psych (for YAML output).
To eliminate this warning, please install libyaml and reinstall your ruby.
Instances> 2
1: 64M
2: 128M
3: 256M
4: 512M
5: 1G
6: 2G
Memory Limit> 256M

Scaling cmpe297-kutschm-assignment2-HelloWorld... OK
Stopping cmpe297-kutschm-assignment2-HelloWorld... OK

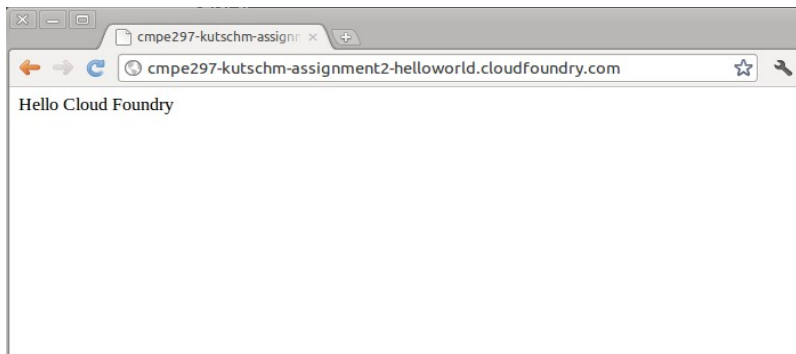
Starting cmpe297-kutschm-assignment2-HelloWorld... OK
Checking cmpe297-kutschm-assignment2-HelloWorld... OK

mkutsch@mkutsch:~/Documents/SJSU/Semester_5/CMPE297/Assi2/HelloWorld$ vmc apps

name                status  usage  runtime  url
cmpe297-kutschm-assignment2-HelloWorld  running  2 x 256M  ruby19  cmpe297-kutschm-assignment2-helloworld.cloudfoundry.com
mkutsch@mkutsch:~/Documents/SJSU/Semester_5/CMPE297/Assi2/HelloWorld$
```

I scaled the application up to use 2 instances and more 256MB of memory. The latest version seems to

have changed their interface to e.g.: vmc instance appname #no\_instances  
Web view:



## 2.) Persisting data into Mongodb

```
mkutschm@mkutsch:~/Documents/SJSU/Semester_5/CMPE297/Ass12/PageHit$ vmc push
/usr/local/lib/ruby/1.9.1/yaml.rb:56:in <top (required)>:
It seems your ruby installation is missing psych (for YAML output).
To eliminate this warning, please install libyaml and reinstall your ruby.
Name> cmpe297-kutschm-assignment2-HitCounter

Instances> 1

1: sinatra
2: other
Framework> sinatra

1: ruby18
2: ruby19
3: other
Runtime> 2

1: 64M
2: 128M
3: 256M
4: 512M
5: 1G
Memory Limit> 128M
Creating cmpe297-kutschm-assignment2-HitCounter... OK

1: cmpe297-kutschm-assignment2-HitCounter.cloudfoundry.com: CodeScri
2: none
URL> cmpe297-kutschm-assignment2-HitCounter.cloudfoundry.com
Updating cmpe297-kutschm-assignment2-HitCounter... OK
Create services for application?> y

1: mongodb 2.0
2: mysql 5.1
3: postgresql 9.0
4: rabbitmq 2.4
5: redis 2.6
6: redis 2.2
7: redis 2.4
What kind?> 1

Name> mongodb-e9c62

Creating service mongodb-e9c62... OK
Binding mongodb-e9c62 to cmpe297-kutschm-assignment2-HitCounter... OK
Create another service?> n

Bind other services to application?> n
Save configuration?> n

Uploading cmpe297-kutschm-assignment2-HitCounter... OK
Starting cmpe297-kutschm-assignment2-HitCounter... OK
Checking cmpe297-kutschm-assignment2-HitCounter... OK
mkutschm@mkutsch:~/Documents/SJSU/Semester_5/CMPE297/Ass12/PageHit$ vmc apps
/usr/local/lib/ruby/1.9.1/yaml.rb:56:in <top (required)>:
It seems your ruby installation is missing psych (for YAML output).
To eliminate this warning, please install libyaml and reinstall your ruby.
Getting applications... OK

name                 status  usage  runtime  url
cmpe297-kutschm-assignment2-HitCounter  running  1 x 128M  ruby19  cmpe297-kutschm-assignment2-hitcounter.cloudfoundry.com
mkutschm@mkutsch:~/Documents/SJSU/Semester_5/CMPE297/Ass12/PageHit$
```

Deployment of HitCounter app. Binds a Mongodb as a bound service.

For this app I used the mongo:Collections group implementation. There is a general aggregation framework api which allows you modelling more workflow like queries by piping one output into the

next operator. I thought the group function is sufficient. Also to not only see a single group, I group by ip, day, hour, and minute.

```
cmpe297-kutschm-assignment2-hitcounter.cloudfoundry.com

{"ip":"32.97.110.58","day":4.0,"hour":2.0,"min":20.0,"count1":14.0}
{"ip":"32.97.110.58","day":4.0,"hour":2.0,"min":22.0,"count1":20.0}
{"ip":"32.97.110.58","day":4.0,"hour":2.0,"min":23.0,"count1":4.0}
{"ip":"32.97.110.58","day":4.0,"hour":2.0,"min":25.0,"count1":3.0}
```

### 3.) Extra Credit

HitCounterMR uses the mongodb mapreduce function to perform complex aggregation like queries in parallel.

This is the deployment:

```
mkutsch@mkutsch:~/Documents/SJSU/Semester 5/CMPE297/Assi2/PageHitMR$ vnc push
/usr/local/lib/ruby/1.9.1/yaml.rb:56:in `<top (required)>':
It seems your ruby installation is missing psych (for YAML output).
To eliminate this warning, please install libyaml and reinstall your ruby.
Name> cmpe297-kutschm-assignment2-HitCounterMR

Instances> 1

1: sinatra
2: other
Framework> sinatra

1: ruby18
2: ruby19
3: other
Runtime> 2

1: 64M
2: 128M
3: 256M
4: 512M
5: 1G
Memory Limit> 128M

Creating cmpe297-kutschm-assignment2-HitCounterMR... OK

1: cmpe297-kutschm-assignment2-HitCounterMR.cloudfoundry.com
2: none
URL> cmpe297-kutschm-assignment2-HitCounterMR.cloudfoundry.com

Updating cmpe297-kutschm-assignment2-HitCounterMR... OK

Create services for application? y

1: mongodb 2.0
2: mysql 5.1
3: postgresql 9.0
4: rabbitmq 2.4
5: redis 2.6
6: redis 2.2
7: redis 2.4
What kind?> 1

Name?> mongodb-be2ef

Creating service mongodb-be2ef... OK
Binding mongodb-be2ef to cmpe297-kutschm-assignment2-HitCounterMR... OK
Create another service?> n

Bind other services to application?> n

Save configuration?> y

Saving to manifest.yml... OK
Uploading cmpe297-kutschm-assignment2-HitCounterMR... OK
Using manifest file manifest.yml

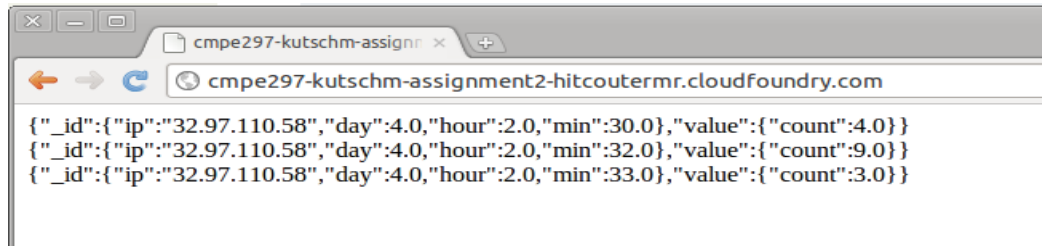
Starting cmpe297-kutschm-assignment2-HitCounterMR... OK
Checking cmpe297-kutschm-assignment2-HitCounterMR... OK
mkutsch@mkutsch:~/Documents/SJSU/Semester 5/CMPE297/Assi2/PageHitMR$ vnc apps
/usr/local/lib/ruby/1.9.1/yaml.rb:56:in `<top (required)>':
It seems your ruby installation is missing psych (for YAML output).
To eliminate this warning, please install libyaml and reinstall your ruby.
Getting applications... OK

name                status  usage  runtime  url
cmpe297-kutschm-assignment2-HitCounterMR  running  1 x 128M  ruby19  cmpe297-kutschm-assignment2-hitcounter.cloudfoundry.com
cmpe297-kutschm-assignment2-HitCounterMR  running  1 x 128M  ruby19  cmpe297-kutschm-assignment2-hitcountermr.cloudfoundry.com
```

The map function basically emits the grouping key (ip, day, hour, minute), and since we just want to

count, it also emits a count: 1 as value.

The reducer function is then invoked on a per group basis and adds all value that belong to a certain grouping key to come up with an over group count.

A screenshot of a web browser window. The address bar shows the URL 'cmpe297-kutschm-assignment2-hitcoutermr.cloudfoundry.com'. The page content displays three JSON objects, each representing a data point with an IP address, time, and a count value.

```
{ "_id": { "ip": "32.97.110.58", "day": 4.0, "hour": 2.0, "min": 30.0 }, "value": { "count": 4.0 } }  
{ "_id": { "ip": "32.97.110.58", "day": 4.0, "hour": 2.0, "min": 32.0 }, "value": { "count": 9.0 } }  
{ "_id": { "ip": "32.97.110.58", "day": 4.0, "hour": 2.0, "min": 33.0 }, "value": { "count": 3.0 } }
```