



# A solution for BigData integrate with Ceph

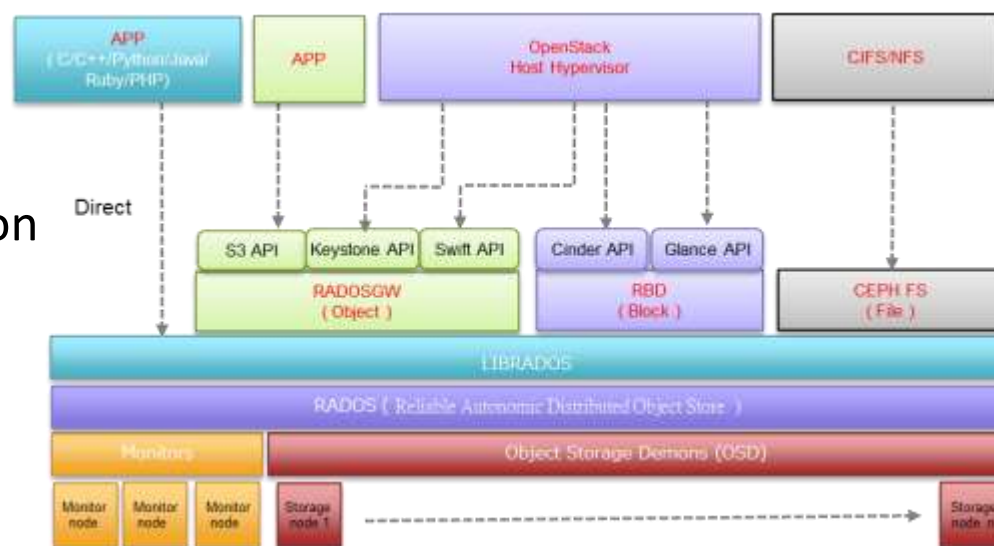
*inwinSTACK / Chief Architect  
Thor Chin*

# Agenda

- ❑ Why we need Ceph?
- ❑ Why we need to integrate Ceph with Big Data?
- ❑ How to integrate Ceph with Big Data?
- ❑ What's Alluxio?
- ❑ Alluxio User List
- ❑ Architecture for Ceph integrate with Big Data
- ❑ Example

# Why we need Ceph?

- ❑ Distributed storage system
  - Fault tolerant , no SPoF
- ❑ X86 Commodity hardware
  - Saving you costs, giving you flexibility
- ❑ Large scale – Incremental expansion
  - 10s to 1000s of nodes
- ❑ Unified storage platform
  - Scalable object , Block , File system.
- ❑ Open source – No vendor lock-in
- ❑ Automatically balance the file system
- ❑ Data security
  - with 2 or more copies in different physical store media.



# Why we need to integrate Ceph with Big Data?

- ❑ Separate Application and Data
- ❑ Better Architecture to solve Hadoop Name Node HA Issue
- ❑ Scalable storage solution
- ❑ High Performance

# How to integrate Ceph with Big Data?

Through an [Interface](#)

Alluxio: A Virtual Distributed Storage System



# What's Alluxio

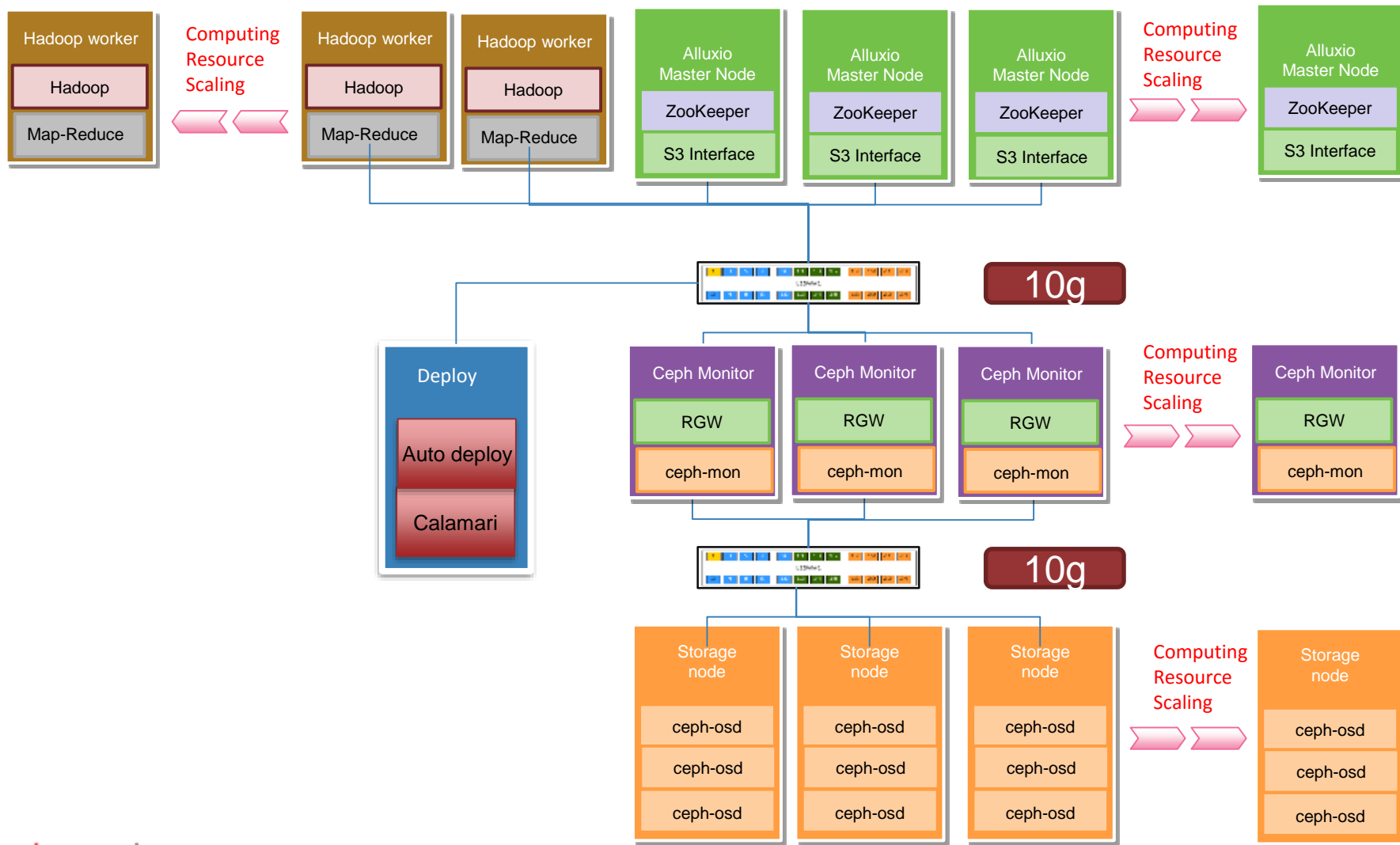
Unified Access	Thriving Community	High Performance
Alluxio is the unified access point for your data. Applications only need to connect with Alluxio to access data in all your under storage systems.	Start from UC Berkeley Open Source Project – Tachyon since 2013 Apr. released 16 versions and rename to Alluxio release 1.0 version in 2016 Feb.	Alluxio's memory-centric architecture enables data access orders of magnitudes faster than existing solutions.
	Fastest growing open source project in big data history with more than 200 contributors from over 50 organizations.	

# Alluxio User List

- ❑ Alibaba
- ❑ Alluxio
- ❑ Arimo
- ❑ Atigeo
- ❑ Baidu
- ❑ Barclays
- ❑ Huawei
- ❑ IBM Research
- ❑ Intel
- ❑ Neusoft
- ❑ Qunar
- ❑ Radicalbit
- ❑ UC Berkeley  
AMPLab
- ❑ Ultra Tendency

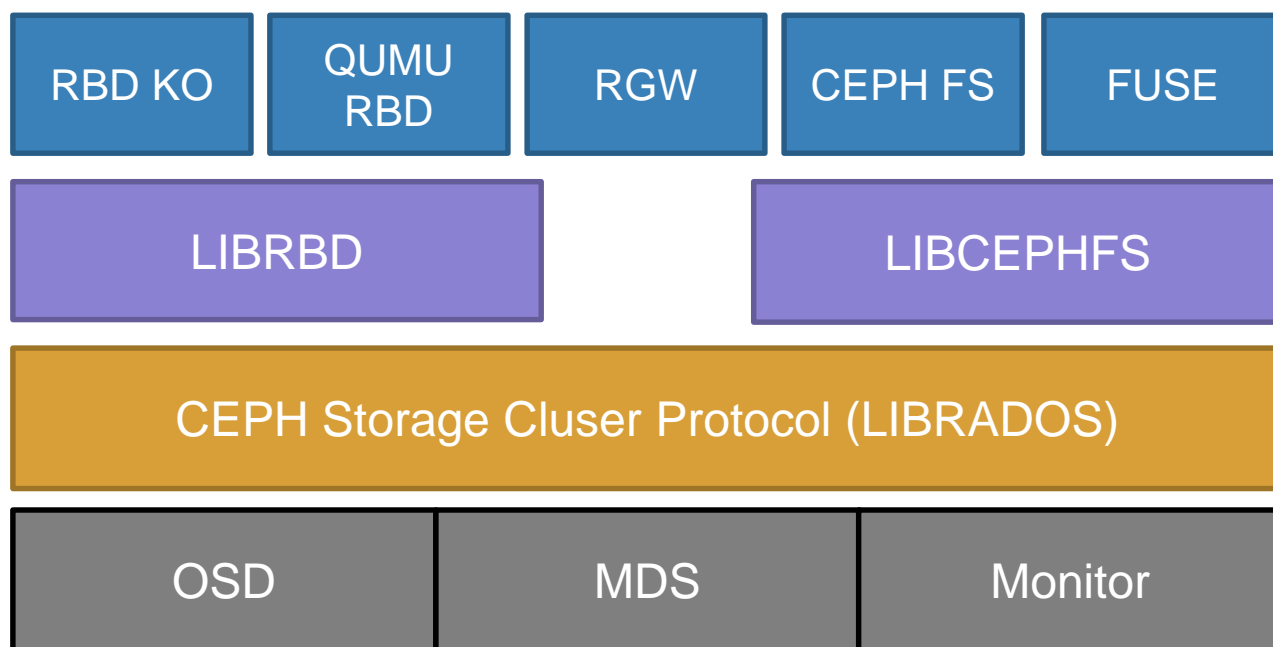
Ref : <http://www.alluxio.org/documentation/en/Powered-By-Alluxio.html>

# Architecture for Ceph integrate with Big Data





# Why we choose RGW rather than CephFS?



# Example



# Alluxio Overview

The screenshot displays the Alluxio Overview page in a web browser. The browser's address bar shows the URL `192.168.244.144:19999/home`. The page features a navigation bar with tabs: Overview (selected), Browse, Configuration, Workers, In-Memory Data, Logs, Metrics, and Enable Auto-Refresh. The main content area is divided into three summary sections: Alluxio Summary, Cluster Usage Summary, and Storage Usage Summary.

**Alluxio Summary**

Master Address:	localhost/127.0.0.1:19998
Started:	07-07-2016 17:05:49:402
Uptime:	0 day(s), 0 hour(s), 0 minute(s), and 36 second(s)
Version:	1.2.0-SNAPSHOT
Running Workers:	1

**Cluster Usage Summary**

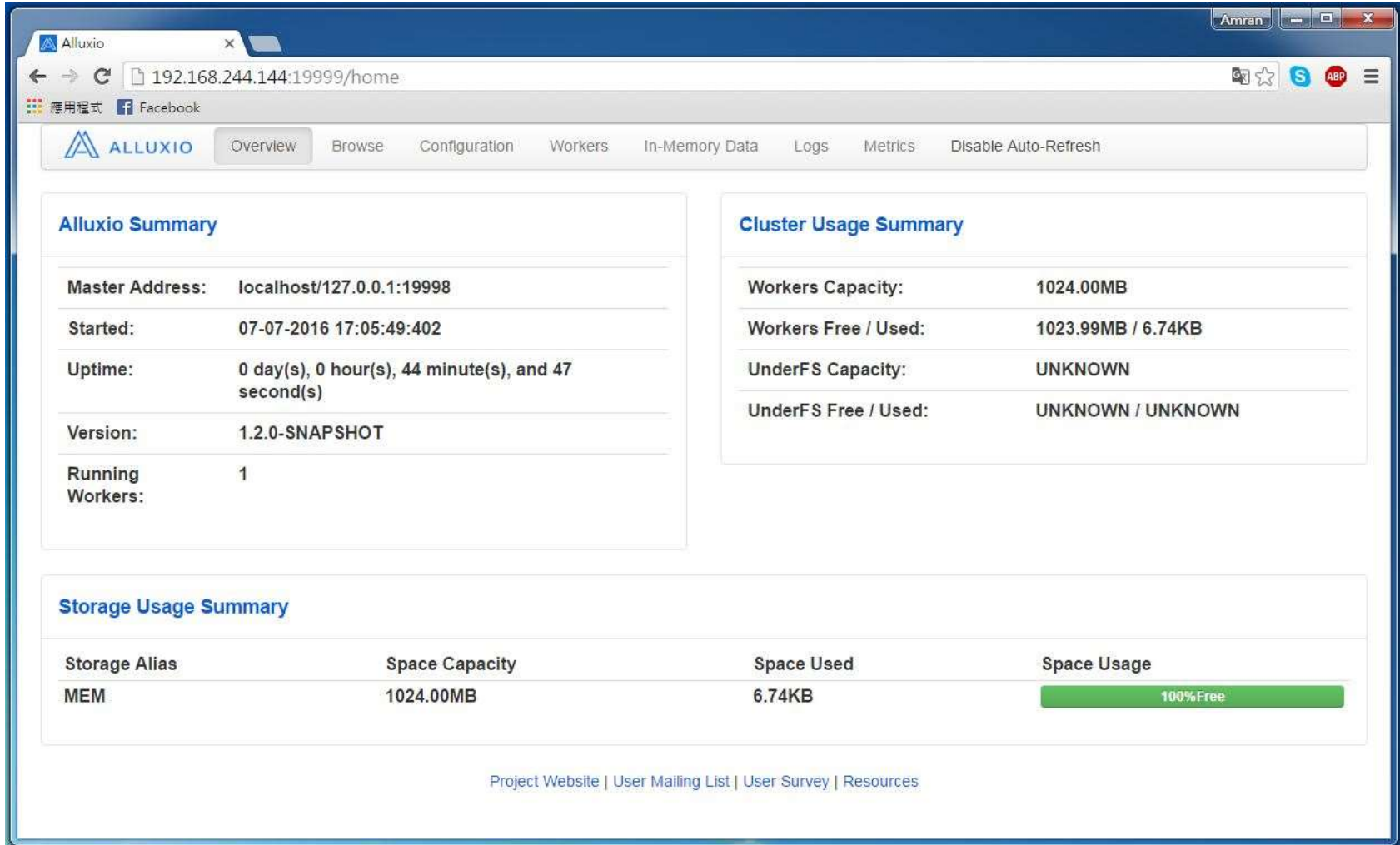
Workers Capacity:	1024.00MB
Workers Free / Used:	1024.00MB / 0.00B
UnderFS Capacity:	UNKNOWN
UnderFS Free / Used:	UNKNOWN / UNKNOWN

**Storage Usage Summary**

Storage Alias	Space Capacity	Space Used	Space Usage
MEM	1024.00MB	0.00B	100% Free

At the bottom of the page, there are links for [Project Website](#), [User Mailing List](#), [User Survey](#), and [Resources](#).

# Enable Auto Refresh



The screenshot shows the Alluxio web interface in a browser window. The address bar displays the URL `192.168.244.144:19999/home`. The interface includes a navigation bar with tabs: Overview, Browse, Configuration, Workers, In-Memory Data, Logs, Metrics, and Disable Auto-Refresh. The main content area is divided into three sections: Alluxio Summary, Cluster Usage Summary, and Storage Usage Summary.

**Alluxio Summary**

Master Address:	localhost/127.0.0.1:19998
Started:	07-07-2016 17:05:49:402
Uptime:	0 day(s), 0 hour(s), 44 minute(s), and 47 second(s)
Version:	1.2.0-SNAPSHOT
Running Workers:	1

**Cluster Usage Summary**

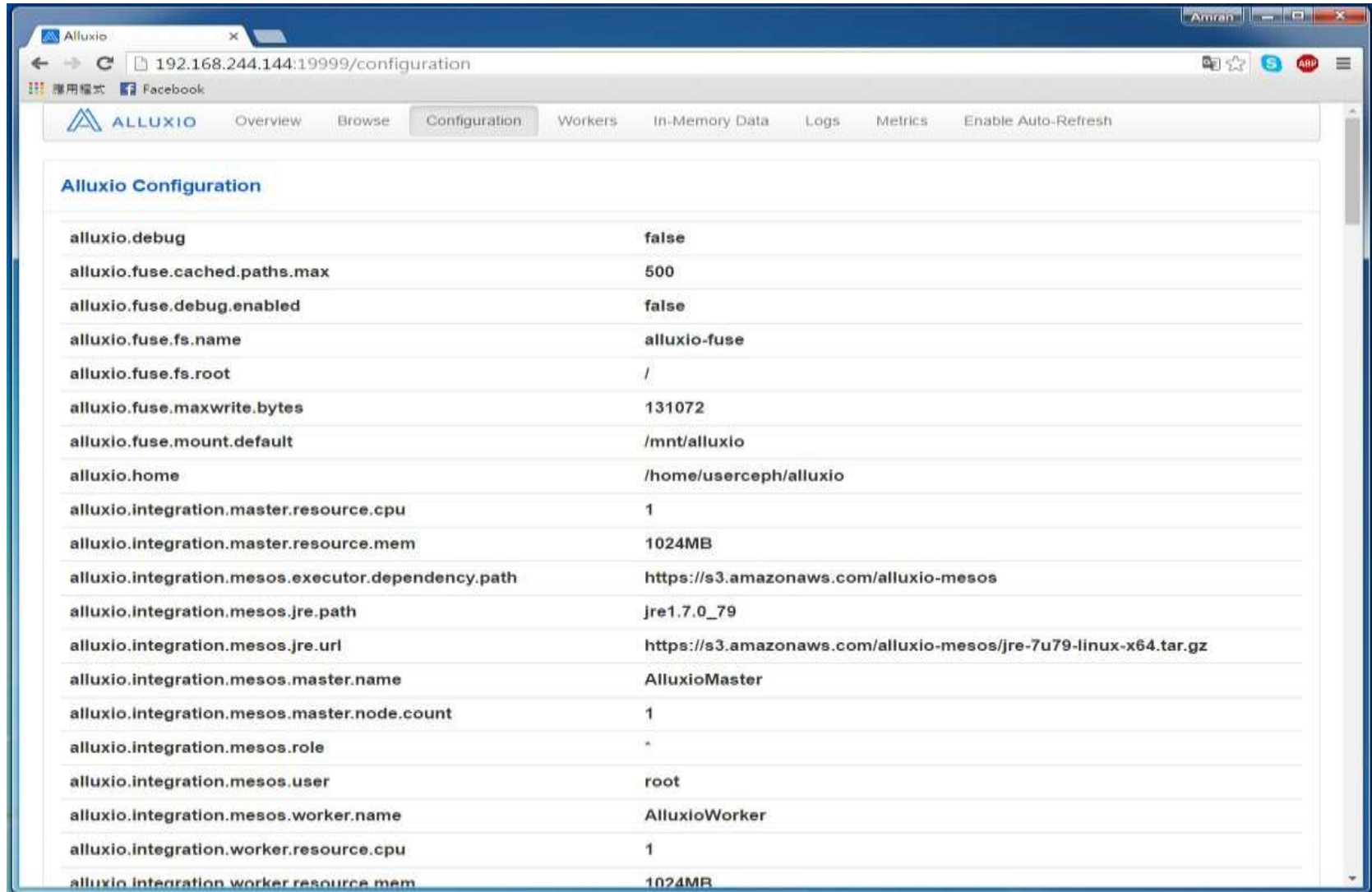
Workers Capacity:	1024.00MB
Workers Free / Used:	1023.99MB / 6.74KB
UnderFS Capacity:	UNKNOWN
UnderFS Free / Used:	UNKNOWN / UNKNOWN

**Storage Usage Summary**

Storage Alias	Space Capacity	Space Used	Space Usage
MEM	1024.00MB	6.74KB	100%Free

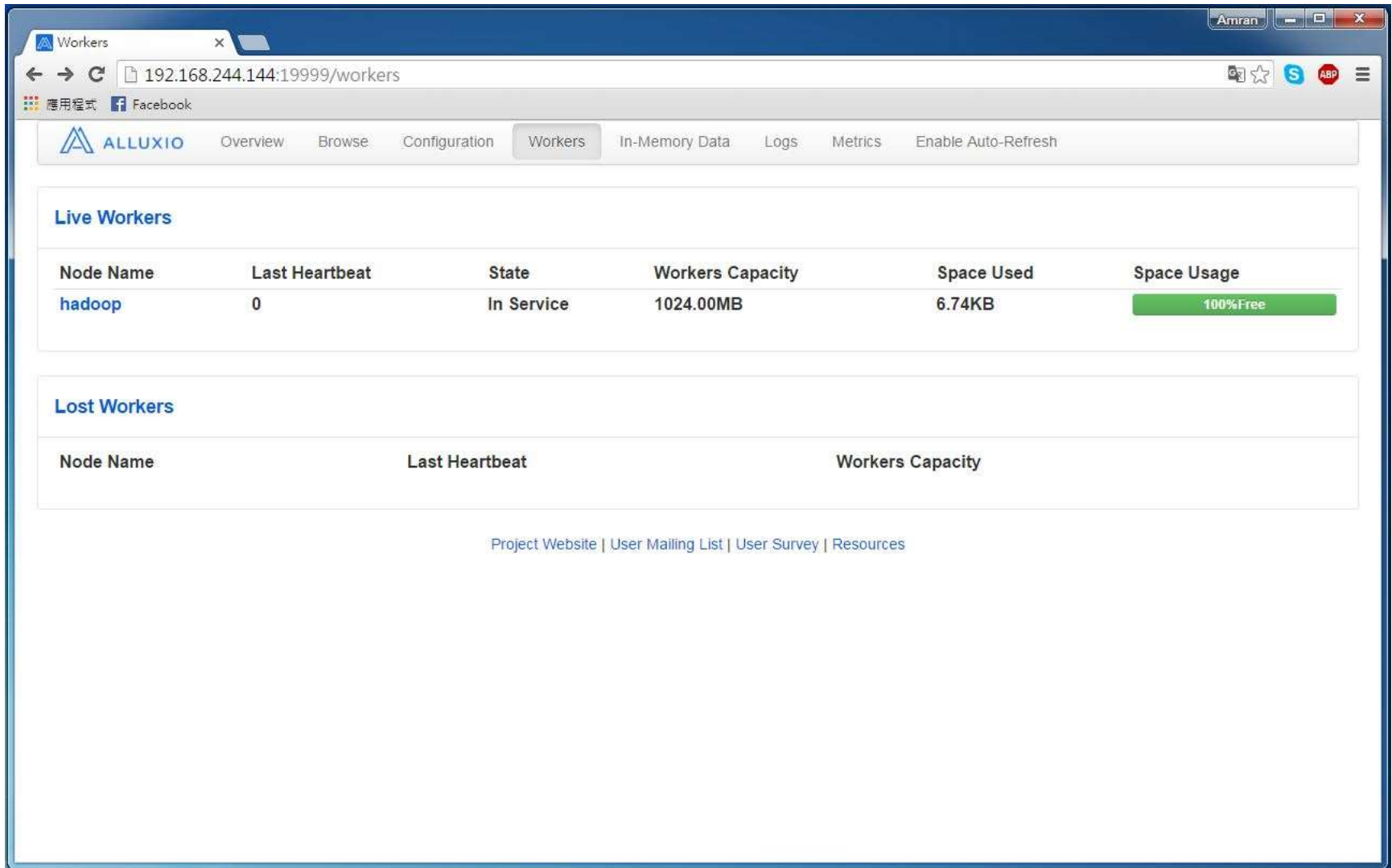
Project Website | User Mailing List | User Survey | Resources

# System Configuration



<b>Alluxio Configuration</b>	
alluxio.debug	false
alluxio.fuse.cached.paths.max	500
alluxio.fuse.debug.enabled	false
alluxio.fuse.fs.name	alluxio-fuse
alluxio.fuse.fs.root	/
alluxio.fuse.maxwrite.bytes	131072
alluxio.fuse.mount.default	/mnt/alluxio
alluxio.home	/home/userceph/alluxio
alluxio.integration.master.resource.cpu	1
alluxio.integration.master.resource.mem	1024MB
alluxio.integration.mesos.executor.dependency.path	https://s3.amazonaws.com/alluxio-mesos
alluxio.integration.mesos.jre.path	jre1.7.0_79
alluxio.integration.mesos.jre.url	https://s3.amazonaws.com/alluxio-mesos/jre-7u79-linux-x64.tar.gz
alluxio.integration.mesos.master.name	AlluxioMaster
alluxio.integration.mesos.master.node.count	1
alluxio.integration.mesos.role	*
alluxio.integration.mesos.user	root
alluxio.integration.mesos.worker.name	AlluxioWorker
alluxio.integration.worker.resource.cpu	1
alluxio.integration.worker.resource.mem	1024MB

# Workers



The screenshot shows a web browser window with the URL `192.168.244.144:19999/workers`. The page title is "Workers". The navigation bar includes the Alluxio logo and links to Overview, Browse, Configuration, Workers (active), In-Memory Data, Logs, Metrics, and Enable Auto-Refresh. The main content area is divided into two sections: "Live Workers" and "Lost Workers".

**Live Workers**

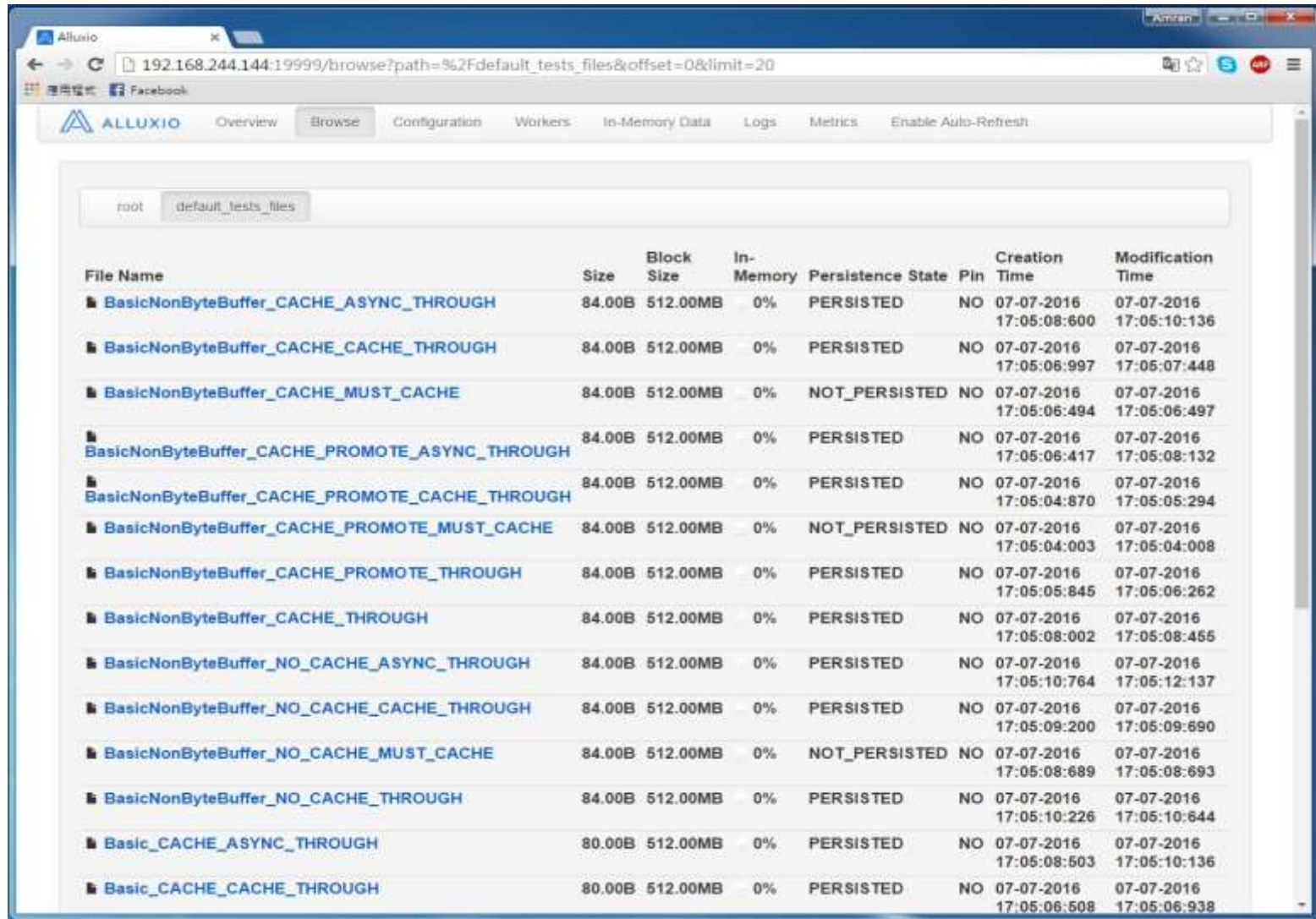
Node Name	Last Heartbeat	State	Workers Capacity	Space Used	Space Usage
hadoop	0	In Service	1024.00MB	6.74KB	100%Free

**Lost Workers**

Node Name	Last Heartbeat	Workers Capacity
-----------	----------------	------------------

At the bottom of the page, there are links: [Project Website](#) | [User Mailing List](#) | [User Survey](#) | [Resources](#).

# Browse File System

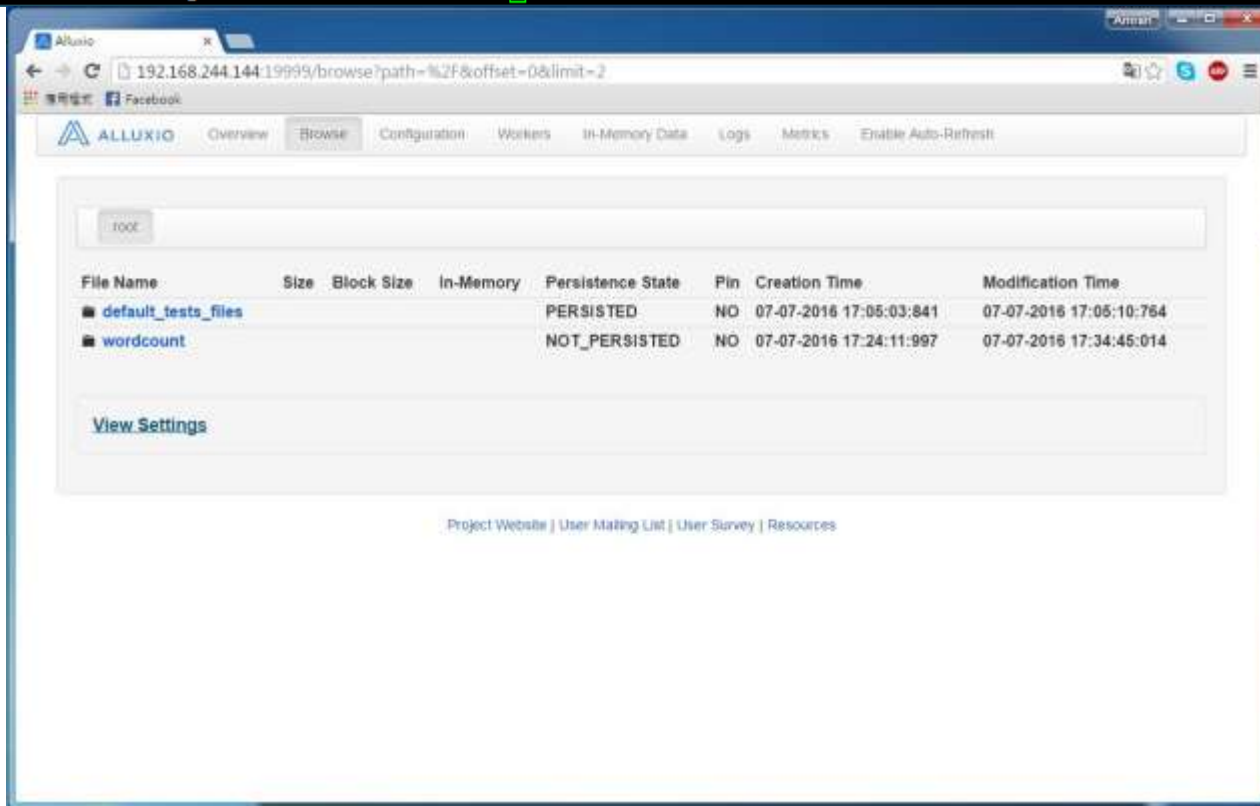


File Name	Size	Block Size	In-Memory	Persistence State	Pin	Creation Time	Modification Time
BasicNonByteBuffer_CACHE_ASYNC_THROUGH	84.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:08:600	07-07-2016 17:05:10:136
BasicNonByteBuffer_CACHE_CACHE_THROUGH	84.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:06:997	07-07-2016 17:05:07:448
BasicNonByteBuffer_CACHE_MUST_CACHE	84.00B	512.00MB	0%	NOT_PERSISTED	NO	07-07-2016 17:05:06:494	07-07-2016 17:05:06:497
BasicNonByteBuffer_CACHE_PROMOTE_ASYNC_THROUGH	84.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:06:417	07-07-2016 17:05:08:132
BasicNonByteBuffer_CACHE_PROMOTE_CACHE_THROUGH	84.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:04:870	07-07-2016 17:05:05:294
BasicNonByteBuffer_CACHE_PROMOTE_MUST_CACHE	84.00B	512.00MB	0%	NOT_PERSISTED	NO	07-07-2016 17:05:04:003	07-07-2016 17:05:04:008
BasicNonByteBuffer_CACHE_PROMOTE_THROUGH	84.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:05:845	07-07-2016 17:05:06:262
BasicNonByteBuffer_CACHE_THROUGH	84.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:08:002	07-07-2016 17:05:08:455
BasicNonByteBuffer_NO_CACHE_ASYNC_THROUGH	84.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:10:764	07-07-2016 17:05:12:137
BasicNonByteBuffer_NO_CACHE_CACHE_THROUGH	84.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:09:200	07-07-2016 17:05:09:690
BasicNonByteBuffer_NO_CACHE_MUST_CACHE	84.00B	512.00MB	0%	NOT_PERSISTED	NO	07-07-2016 17:05:08:689	07-07-2016 17:05:08:693
BasicNonByteBuffer_NO_CACHE_THROUGH	84.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:10:226	07-07-2016 17:05:10:644
Basic_CACHE_ASYNC_THROUGH	80.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:08:503	07-07-2016 17:05:10:136
Basic_CACHE_CACHE_THROUGH	80.00B	512.00MB	0%	PERSISTED	NO	07-07-2016 17:05:06:508	07-07-2016 17:05:06:938

# Add Wordcount for Testing


\$ ./bin/alluxio fs copyFromLocal /home/hduser/myfile /wordcount/myfile

```
hduser@alhadoop:~/alluxio-1.0.1$ ./bin/alluxio fs copyFromLocal /home/hduser/myfile /wordcount/myfile
Copied /home/hduser/myfile to /wordcount/myfile
hduser@alhadoop:~/alluxio-1.0.1$
```








# Alluxio Wordcount output


 ALLUXIO

OverviewBrowseConfigurationWorkersIn-Memory DataLogsMetricsEnable Auto-Refresh

rootwordcount





File Name	Size	Block Size	In-Memory	Persistence State	Pin	Creation Time	Modification Time
 myfile	4098.00B	512.00MB	 100%	NOT_PERSISTED	NO	07-07-2016 17:24:11:997	07-07-2016 17:24:12:212
 output				NOT_PERSISTED	NO	07-07-2016 17:34:45:014	07-07-2016 17:35:07:111

[View Settings](#)

 ALLUXIO


OverviewBrowseConfigurationWorkersIn-Memory DataLogsMetricsEnable Auto-Refresh

rootwordcountoutput

File Name	Size	Block Size	In-Memory	Persistence State	Pin	Creation Time	Modification Time
 _SUCCESS	0.00B	512.00MB	 100%	NOT_PERSISTED	NO	07-07-2016 17:35:07:111	07-07-2016 17:35:07:119
 part-r-00000	2808.00B	512.00MB	 100%	NOT_PERSISTED	NO	07-07-2016 17:35:06:409	07-07-2016 17:35:06:530

[View Settings](#)

# Alluxio Wordcount output (Cont.)

 [Overview](#) [Browse](#) [Configuration](#) [Workers](#) [In-Memory Data](#) [Logs](#) [Metrics](#) [Enable Auto-Refresh](#)

**/wordcount/output/part-r-00000: First 5KB from 0 in ASCII**

```
a 11
able 1
about 1
access 1
actual 1
address 1
affecting 1
after 2
all 1
allocation 1
also 1
an 3
and 24
any 1
application 1
are 6
as 2
assigned 2
at 1
attributes 1
automatically 1
available 1
balancing 1
```

Display from byte offset  relative to ☒ begin ☐ end

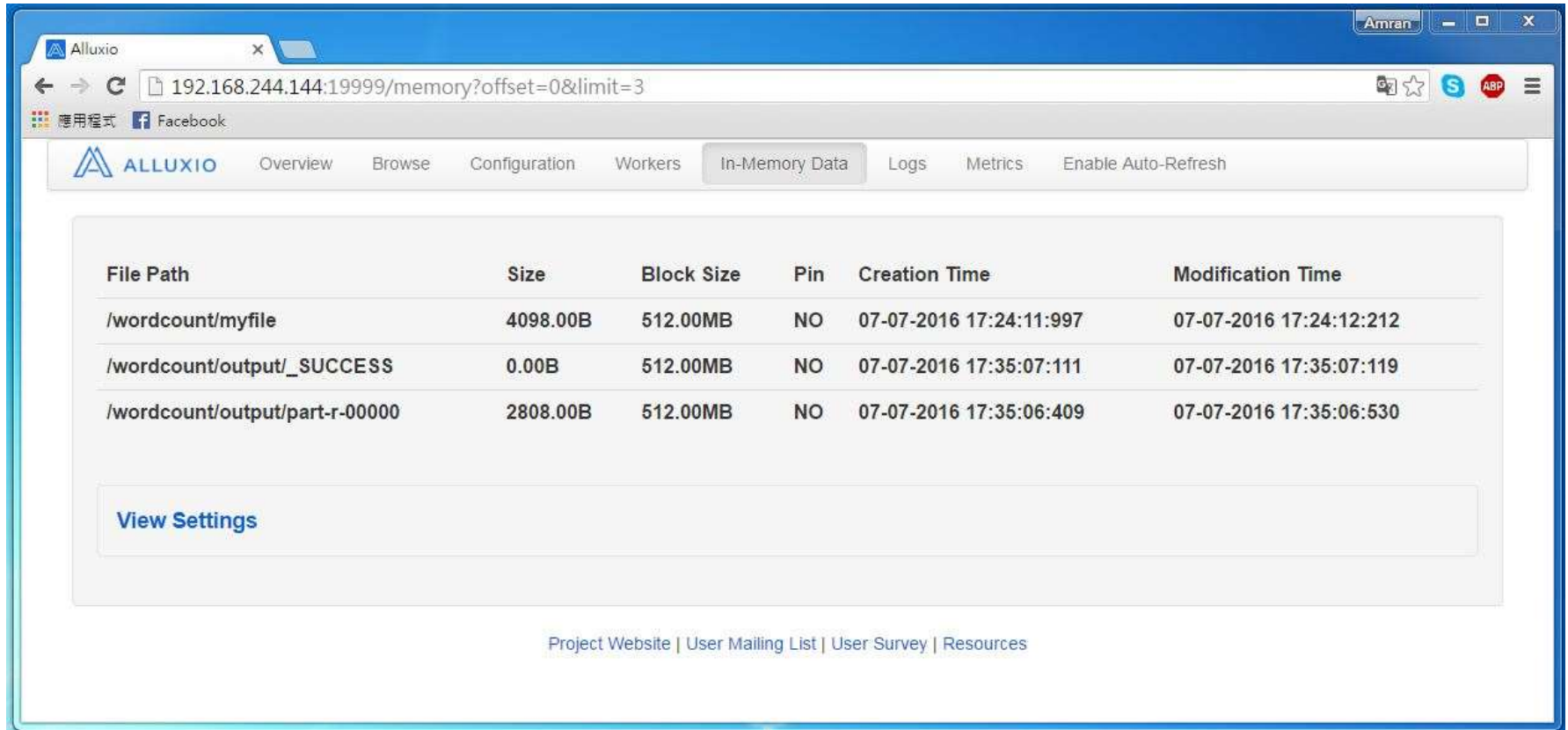
[Download](#)

Detailed blocks information (block capacity is 512.00MB Bytes):

ID	Size (Byte)	In MEM	Locations
16810770432	2808	Yes	<a href="#">hadoop</a>

[Project Website](#) | [User Mailing List](#) | [User Survey](#) | [Resources](#)

# In-memory Data



The screenshot shows the Alluxio web interface in a browser window. The address bar displays the URL `192.168.244.144:19999/memory?offset=0&limit=3`. The navigation menu includes **ALLUXIO**, Overview, Browse, Configuration, Workers, **In-Memory Data** (active), Logs, Metrics, and Enable Auto-Refresh. The main content area displays a table of in-memory data with the following columns: File Path, Size, Block Size, Pin, Creation Time, and Modification Time. The table contains three entries. Below the table is a [View Settings](#) button. At the bottom of the interface, there are links for Project Website, User Mailing List, User Survey, and Resources.

File Path	Size	Block Size	Pin	Creation Time	Modification Time
/wordcount/myfile	4098.00B	512.00MB	NO	07-07-2016 17:24:11:997	07-07-2016 17:24:12:212
/wordcount/output/_SUCCESS	0.00B	512.00MB	NO	07-07-2016 17:35:07:111	07-07-2016 17:35:07:119
/wordcount/output/part-r-00000	2808.00B	512.00MB	NO	07-07-2016 17:35:06:409	07-07-2016 17:35:06:530

[View Settings](#)

[Project Website](#) | [User Mailing List](#) | [User Survey](#) | [Resources](#)

# Logs

192.168.244.144:19999/browseLogs?path=&offset=0&limit=4

ALLUXIO Overview Browse Configuration Workers In-Memory Data **Logs** Metrics Enable Auto-Refresh

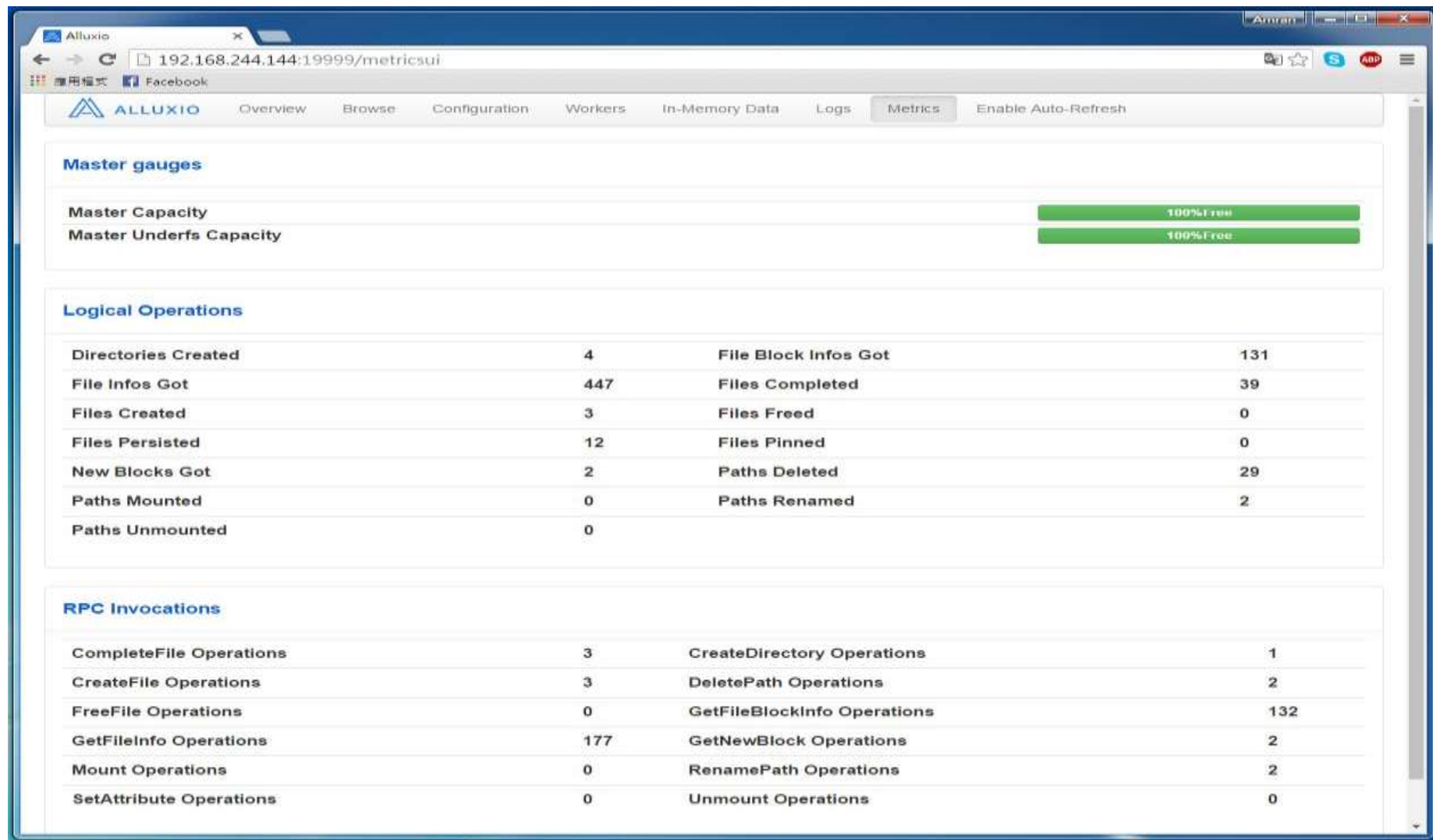
File Name Size Block Size In-Memory Persistence State Pin Creation Time Modification Time

<a href="#">master.log</a>	196.74KB	0.00B	0%	NOT_PERSISTED	NO		07-07-2016 17:42:53:000
<a href="#">task.log</a>	2944.00B	0.00B	0%	NOT_PERSISTED	NO		07-07-2016 17:05:43:000
<a href="#">user_userceph.log</a>	3544.00B	0.00B	0%	NOT_PERSISTED	NO		07-07-2016 17:36:24:000
<a href="#">worker.log</a>	86.16KB	0.00B	0%	NOT_PERSISTED	NO		07-07-2016 17:35:06:000

[View Settings](#)

[Project Website](#) | [User Mailing List](#) | [User Survey](#) | [Resources](#)

# Metrics



# Ceph APAC Road show 2016



8/24 集思台大會議中心

## TRANSFORM STORAGE IN PERSON

Join the expert Ceph team, Ceph's customers and partners, and the Ceph community as we discuss how Ceph, the massively scalable, open source, software-defined storage system, can radically improve the economics and management of data storage for your enterprise.



*Thank You!*



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