

# Object Storage Investigation

(High Five's & Bash Scripts)

2019 Academy Project

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# Overview

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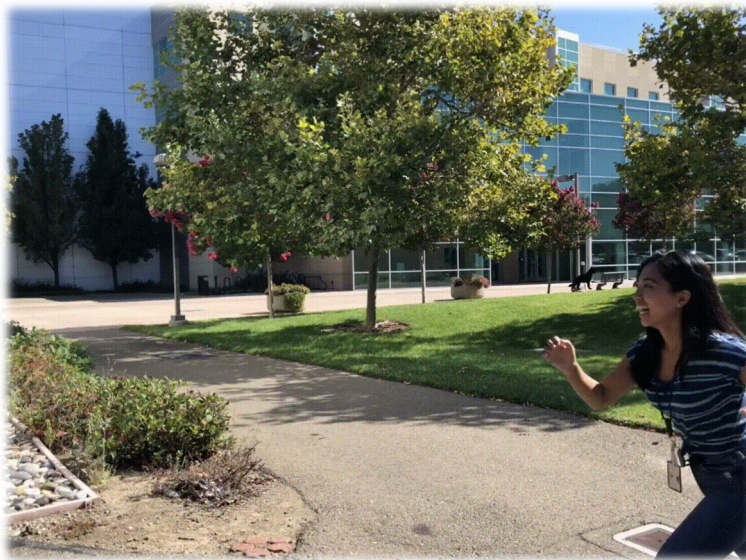
- Meet the Team
- What is all this buzz about Object Storage?
- Different Storage Architecture
- MinIO - Successes / Challenges
  - mc (MinIO Client)
- Ceph - Successes / Challenges
  - S3 API - python cmdline, s3cmd
- Wrap-Up

# Object Storage Team

Garrett Slone



LAS POSITAS  
COLLEGE



[./morninghighfives.sh](https://morninghighfives.sh)

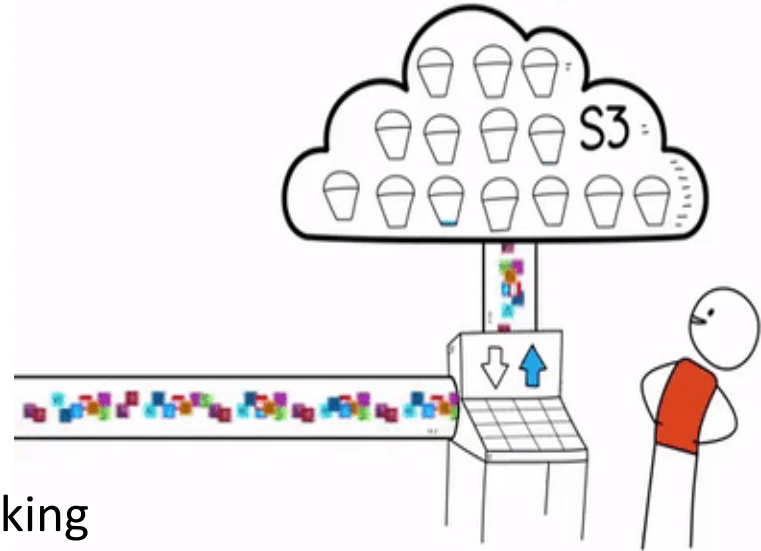
Hoa Ngo



CAL STATE  
EAST BAY

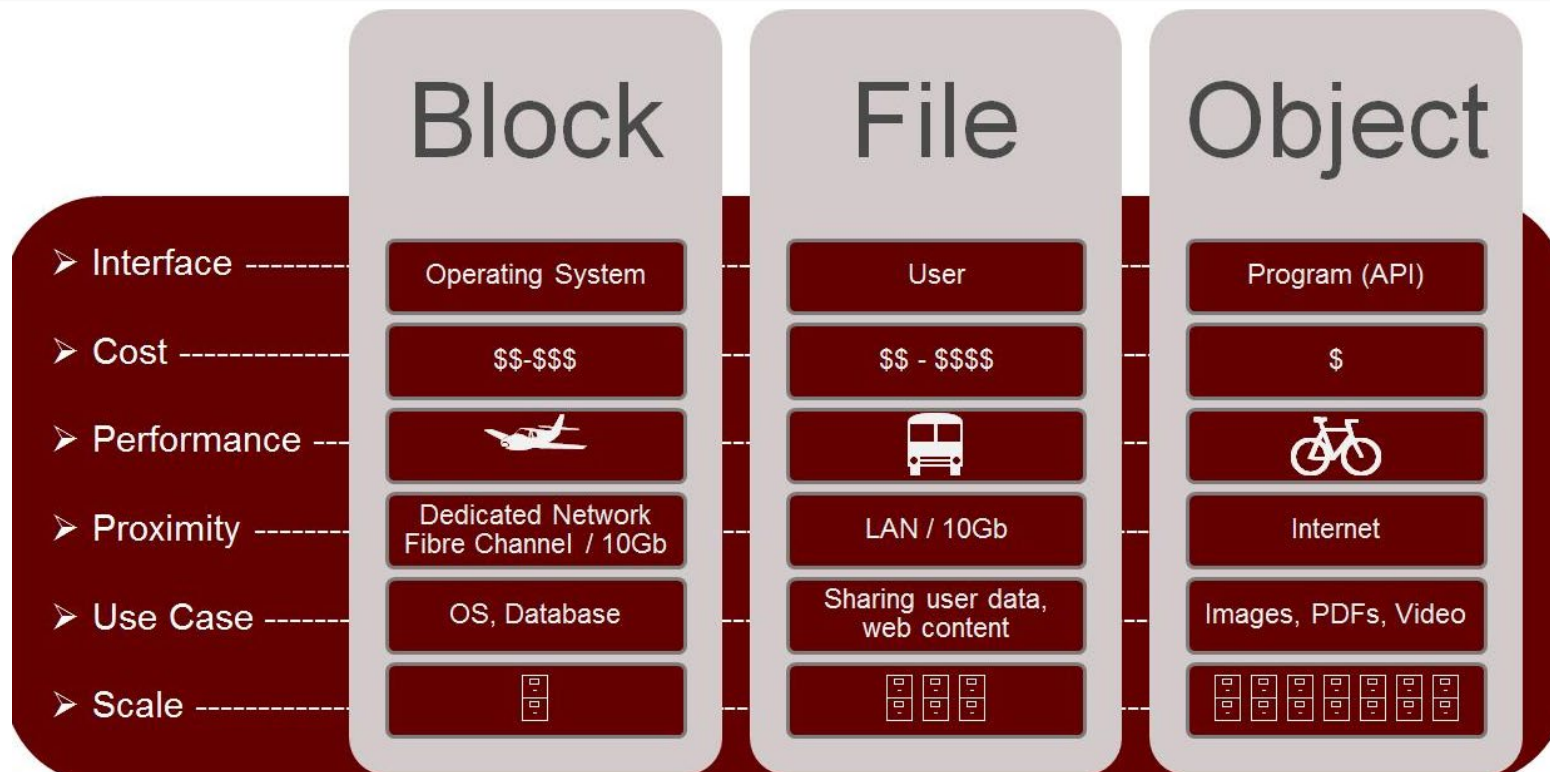
# What is Object Storage?

- Alternative storage architecture
- 3 main components of objects:
  - Data
  - Metadata
  - Globally Unique Identifier
- Comparable to the system of valet parking



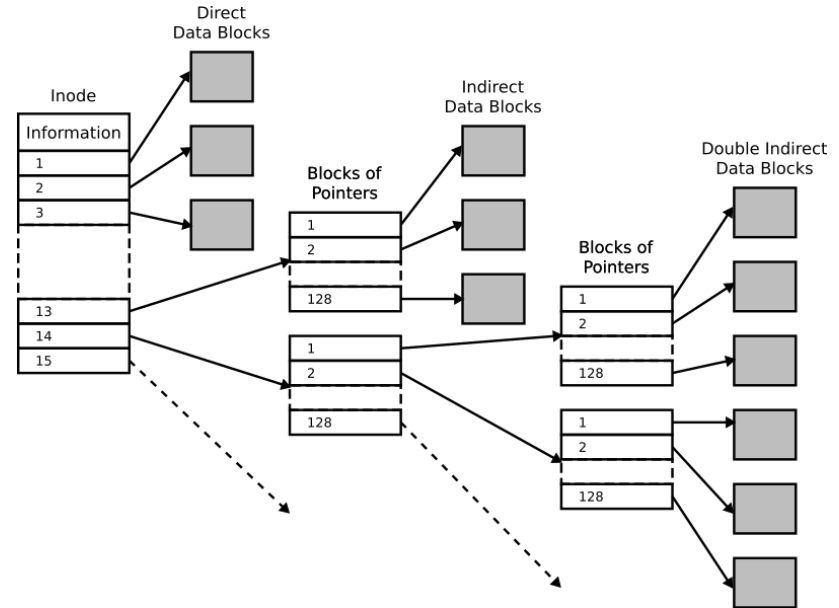
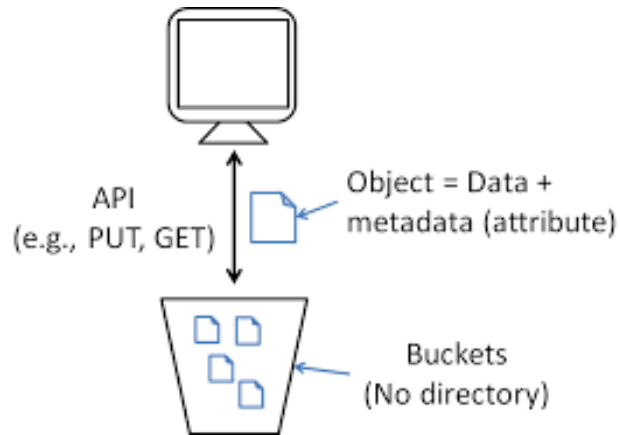


# Differences (File, Block, Object)



# Differences (cont.)

- Metadata





- Silicon-valley based tech startup (2014)
- Object storage server
- compatible with S3 interface
- MC = minIO client
  - minIO interface

## Successes



## Challenges

- Easy to install
- Comes w/ its own client interface:  
MC
- works well through GUI

- Server stopped if not ran as a service
- Security
- Full functionality cannot be access through CLI

```
[root@xenoni ~]# mc admin user disable team slone5
Disabled user `slone5` successfully.
[root@xenoni ~]# mc admin user set-policy team slone5 writeonly
Set a policy `writeonly` for user `slone5` successfully.
[root@xenoni ~]# mc admin user list team
enabled    ngo17                writeonly
disabled   slone5              writeonly
[root@xenoni ~]# su - slone5
Last login: Fri Jul 12 10:36:27 PDT 2019 on pts/1
[slone5@xenoni ~]$ mc ls slone5/slone5bucket
[2019-07-12 10:10:36 PDT]    0B it
[2019-07-11 15:46:33 PDT]    0B test.txt
[2019-07-09 16:12:40 PDT]  117B viminst.sh
```



# Ceph – Red Hat Enterprise Object Storage



- *fun fact: first line of code ended up being part of Ceph written by Sage Weil @ a summer internship HERE at LLNL*
- Components:
  - Admin (ceph-admin)
  - Cluster Monitor (ceph-mon)
  - Object Storage OSDs (ceph-osds)
  - Rados Gateway (ceph-gateway)

## Successes



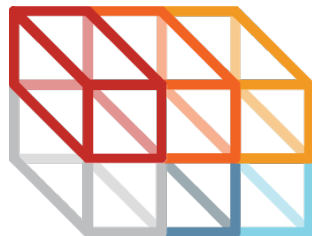
## Challenges

- Fully installed
- Interfaced with S3 API
  - can also be interfaced with Swift API (have not yet been tested)
  - aws s3cmd
  - python

- Security
- Confusing installation
- Usage

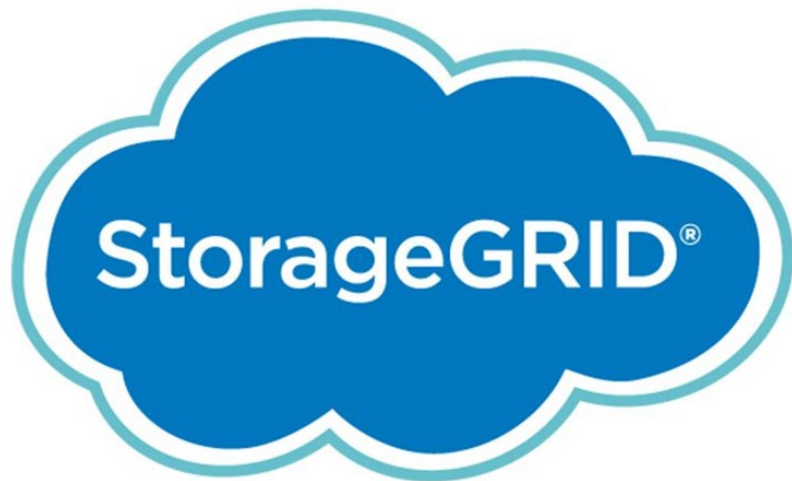
## Future Work

- OpenIO
- Triton
- Storage Grid



Joyent

# TRITON™



# SPECIAL THANKS

David Fox  
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Rigo Moreno Delgado  
Elsa Gonsiorowski  
Jason Shortino  
Jean Shuler  
Bryan Dixon



# Sources

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Anonymous - <https://gfycat.com/illegalinsistentarmednylonshrimp>

2) Object Storage Vs. Block Storage

Abhishek Ghosh-Abhishek Ghosh - <https://thecustomizewindows.com/2017/09/object-storage-vs-block-storage/>

3) [https://upload.wikimedia.org/wikipedia/commons/4/4b/Object\\_Storage\\_Icon.png](https://upload.wikimedia.org/wikipedia/commons/4/4b/Object_Storage_Icon.png)

4) Inode Pointer Structure

[https://en.wikipedia.org/wiki/Inode\\_pointer\\_structure](https://en.wikipedia.org/wiki/Inode_pointer_structure)



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