Deep Dive into Ceph
... and how to use it for iRODS
FOUNDED IN 2012
SOFTIRON IS A VENTURE BACKED COMPANY

TASK-SPECIFIC
DATA CENTER SOLUTIONS

50 STAFF MEMBERS & GROWING

$40M+ EQUITY RAISED
FROM HIGH NET WORTH INDIVIDUALS, INSTITUTIONAL INVESTORS & PRIVATE COMPANIES.

WE ARE A GLOBAL COMPANY WITH OFFICES IN
UNITED STATES OF AMERICA • UNITED KINGDOM • CZECH REPUBLIC • AUSTRALIA • NEW ZEALAND
Fully supported – any Ceph, any location

Skillset limitations
Strategic open source infrastructure adoption
Mixed cloud native/traditional workloads
Secure Provenance

HyperDrive
Lack of on-site expertise
Low space/heat/dust control

HyperDrive
Power economics
Remote locations

HyperDrive
Unamortized hardware
Production Ceph deployment

HyperSafe
HyperDrive – where hardware matters most
HyperSafe – best in class enterprise Ceph support
SoftIron – the only vendor that can do it all
Built on Open Source

Ceph is the Swiss Army Knife of the SDS world

Ceph has that Linux-like magic combination of qualities that heralds its destiny: accessibility, openness, unparalleled flexibility, rich features, an impressive and growing roster of enterprise ambassadors, and a deep and devoted user community.
Traditional Storage Architecture
Traditional Storage Architecture
Scaling Out (SDS)
Ceph Architecture

LIBRADOS
A set of libraries for directly interacting with RADOS from client applications with support for C, C++, Python, Java, PHP, and Ruby

RBD
Rados Block Device

RGW
Rados Gateway

CephFS
POSIX-compliant filesystem

RADOS
Distributed Object Store
Ceph Daemons

OSD

Monitor

Manager

RGW
Traditional Data Placement

Hey, I have this object, where do you want it?

controller
controller
controller

LUN32!
CRUSH

Calculate placement algorithmically based on cluster map and object name.
Placement Groups
CephFS

Client:
- kCephFS

Data Pool:
- OSD
- MON

Metadata Pool:
- MDS

OSD
- OSD
- OSD
- OSD
- OSD
- OSD
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Recent releases and key features

Nautilus - March 2019
- Easier to use and manage Placement groups
- Encryption in transit
- Improved S3 performance due to backend server replacement

Octopus - March 2020
- S3 Bucket Replication
- S3 Bucket Notifications
- S3 Object Lock

Pacific - March 2021
- New and official Ceph RESTful API
- Multiple CephFS Filesystems
- CephFS Windows Support
Example – Enterprise Class Storage needs integrated management

- Eliminate the need for “command line warriors”
- Hardware auto-discovery wizard
- Rules to prevent bad setups and prompts
- Quick physical location of the actual disc that needs attention
- Easily add or remove machines to a cluster
- Multiple admin “lockout” feature
- ONLY possible with task specific hardware
iRODS Integration

S3 Resource Plugin

Can address Ceph just like any other S3 interface in iRODS

UnixFilesystem Resource Plugin

Can mount CephFS (or even RBD) straight into iRODS via Unix

RADOS Resource Plugin

Works, but hasn’t been updated in a couple of years
Had some issues recently, which have been fixed