



NEW LAUNCH!

Introducing AWS Snowmobile and AWS Snowball Edge

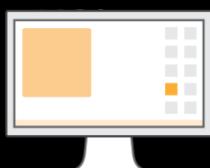
Colin Lazier, General Manager Amazon Glacier,
AWS Snowball, & AWS Snowmobile

Jay Littlepage, VP, Infrastructure & Operations,
DigitalGlobe

Rich Ridolfo, Sr. Dir, Operations, Philips

December 1, 2016

Migrating large scale data is challenging



Speed



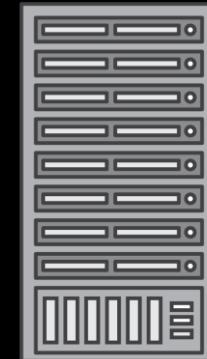
Cost



Logistics



Security



The AWS data transport solution

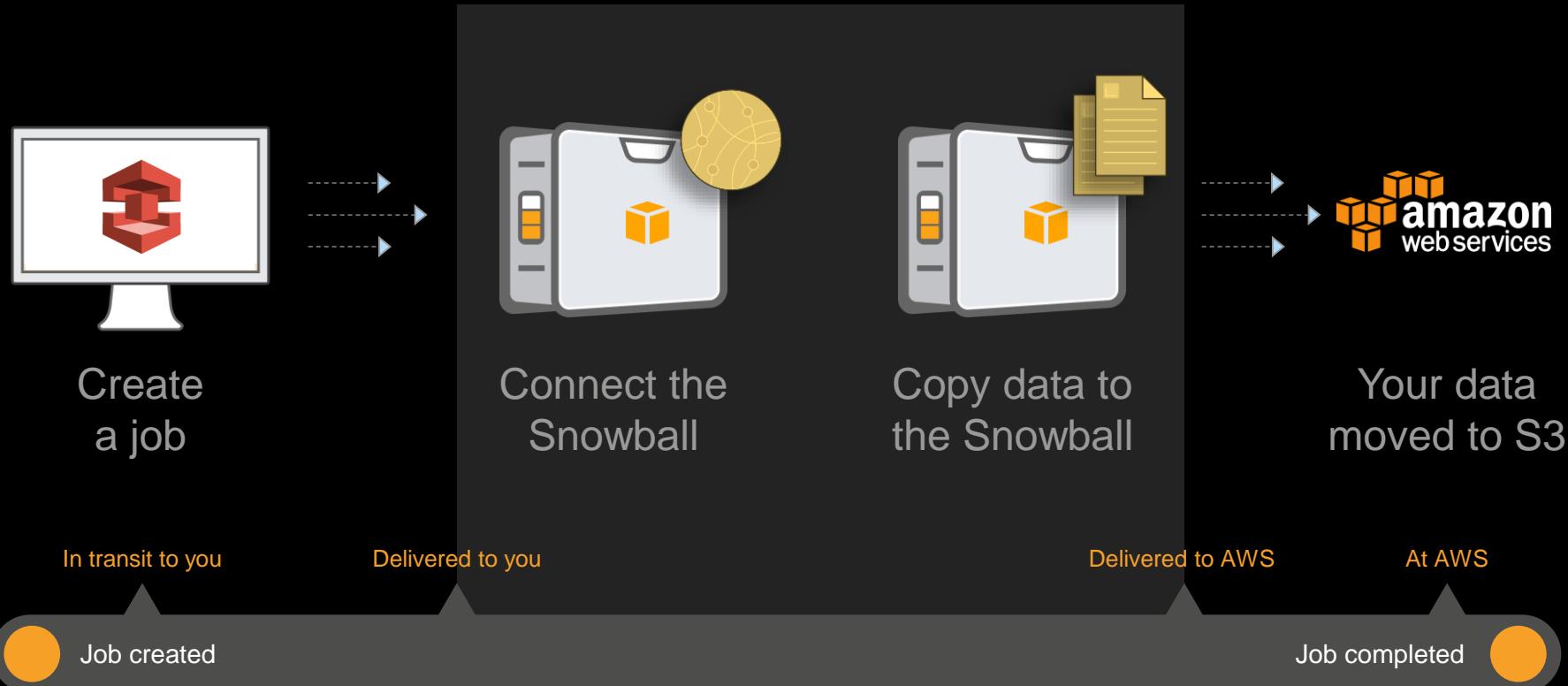
AWS Snowball—petabyte scale data transport



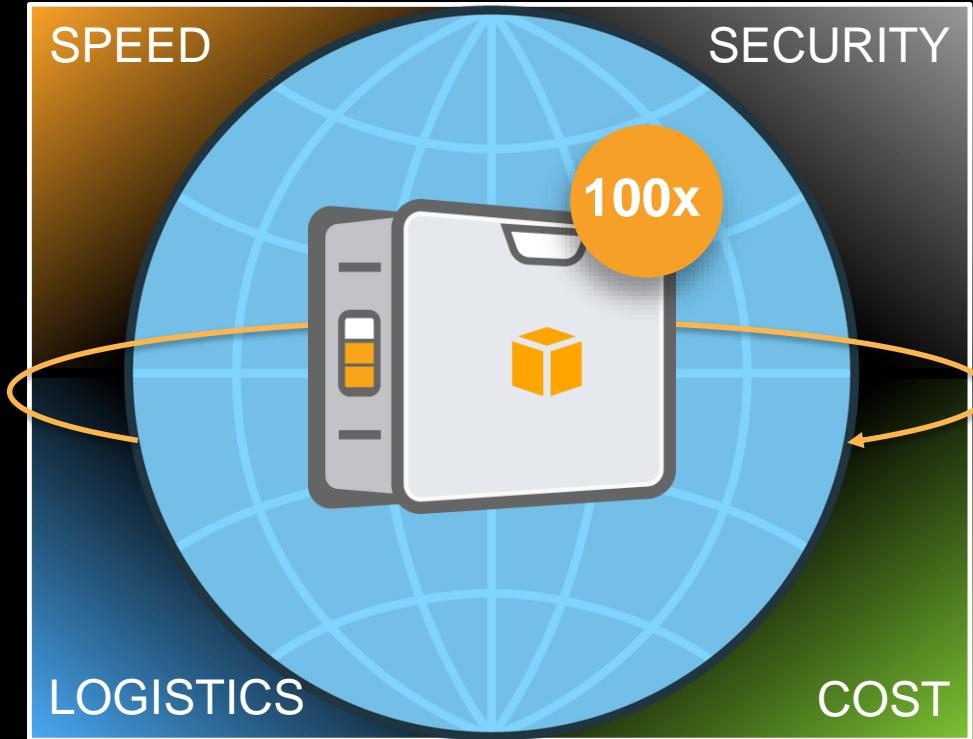
RE:INVENT 2015 LAUNCH

- Rugged 8.5G impact case
- E-ink shipping label
- Data encryption end-to-end
- 50 TB capacity/10G network

How Snowball moves data into and out of AWS



Snowball to date



- 80TB Snowball
- HIPAA Compliance
- Regions:
 - N. Virginia, Ohio, Oregon,
 - N. California, GovCloud,
 - Ireland, Frankfurt, Sydney
- Client updates
 - HDFS Ingest
 - S3 Compatible Endpoint

Challenges at extreme scale

Exabyte

100PB

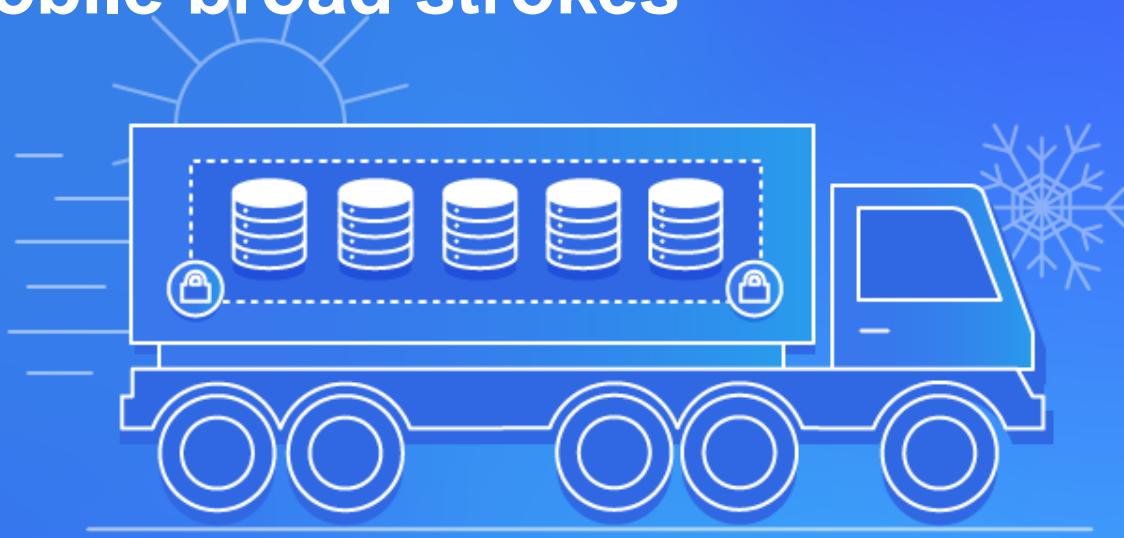
80TB



Increased logistics complexity

Increased time for cycles

Snowmobile broad strokes



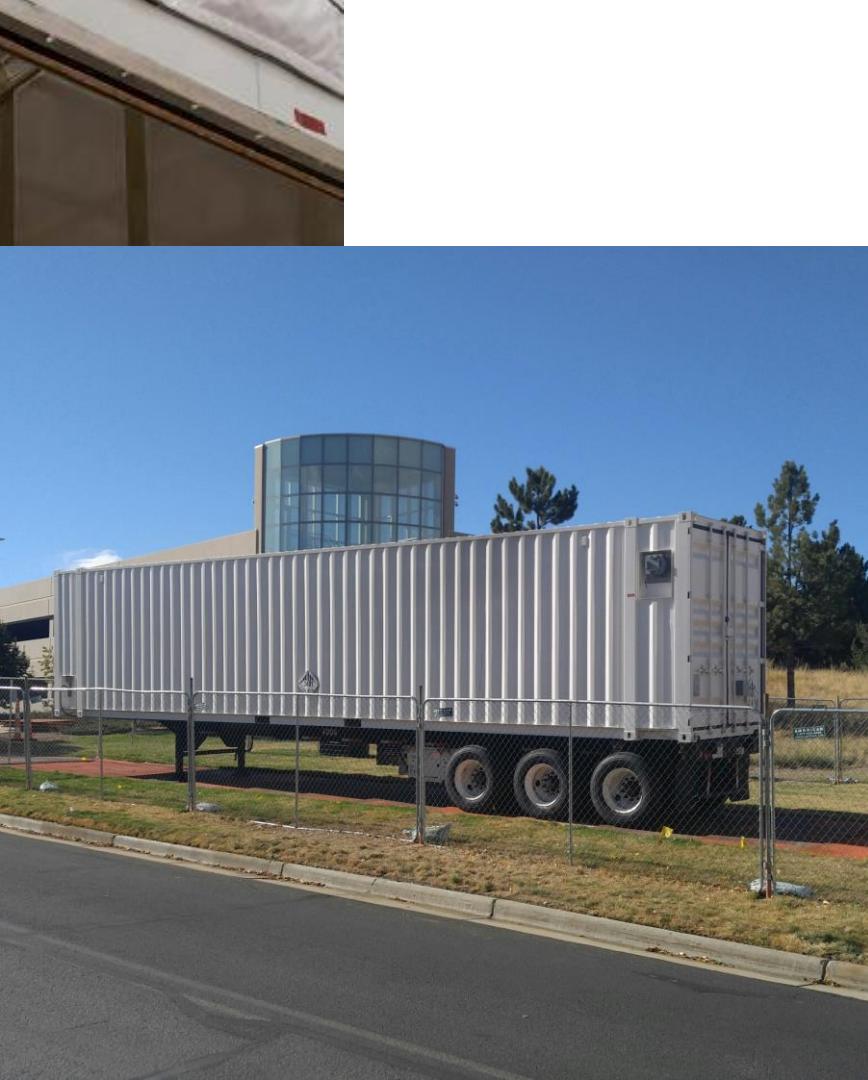
- 100 Petabytes per job
- Truck with 45 foot container
- 68,000 pounds
- Up to 500Gbps
- Site Survey
- Dispatch
- Fill
- Return for Ingest



DigitalGlobe

Jay Littlepage









Worldview3 location: 1480 km west of Los Angeles (Lat/Lon 32.58 N/133.96 W)
slant range from Las Vegas: 1950 km at an azimuth of 263 deg (W)

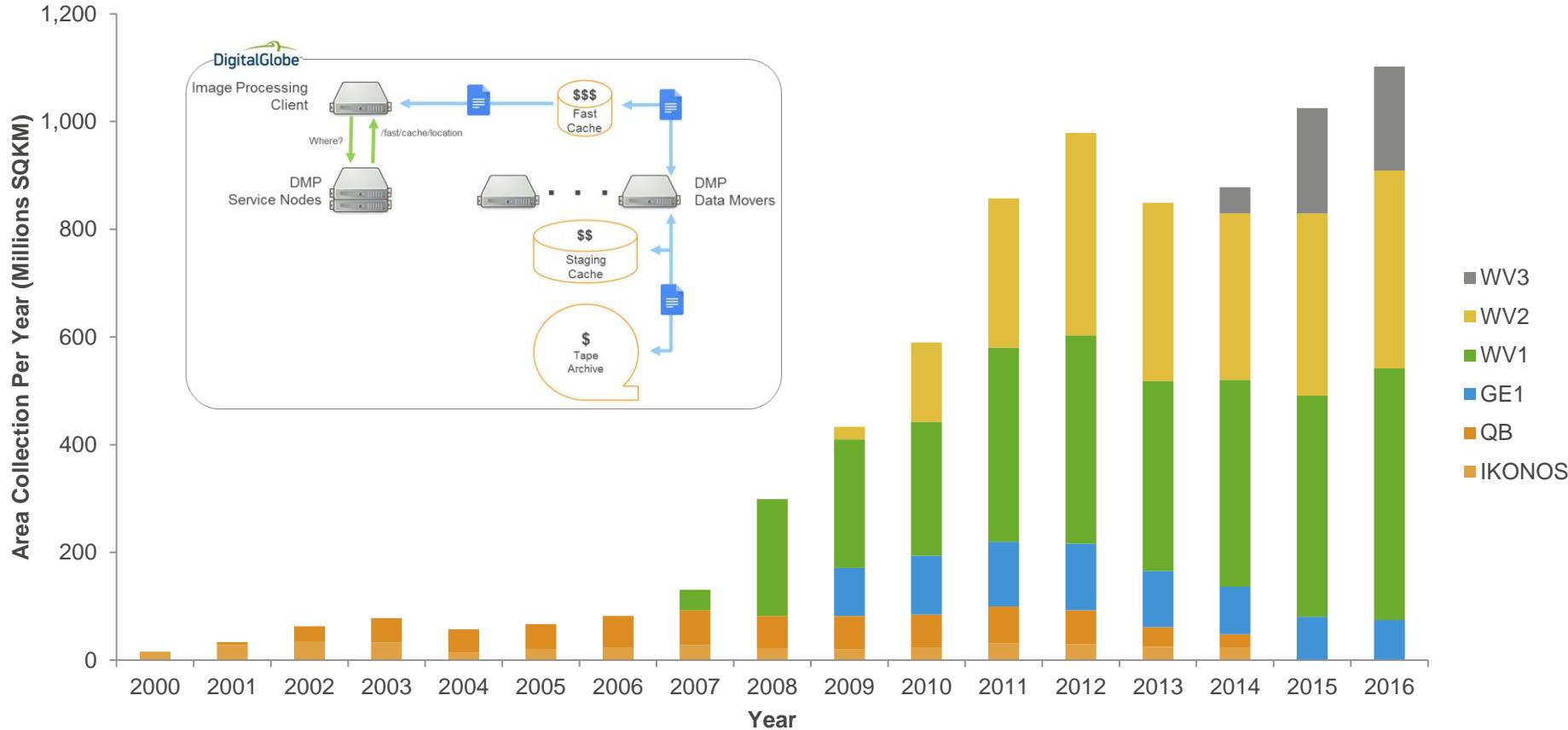


Dealing with “Data Boulders from Space”

- A single image from WorldView3 is 12GB.
- We are imaging 24x7, adding 85TB of imagery to our archive, every day.



“Seeing a Better World” for 16 years, with more sensors at higher resolution, adds up to a data management challenge.



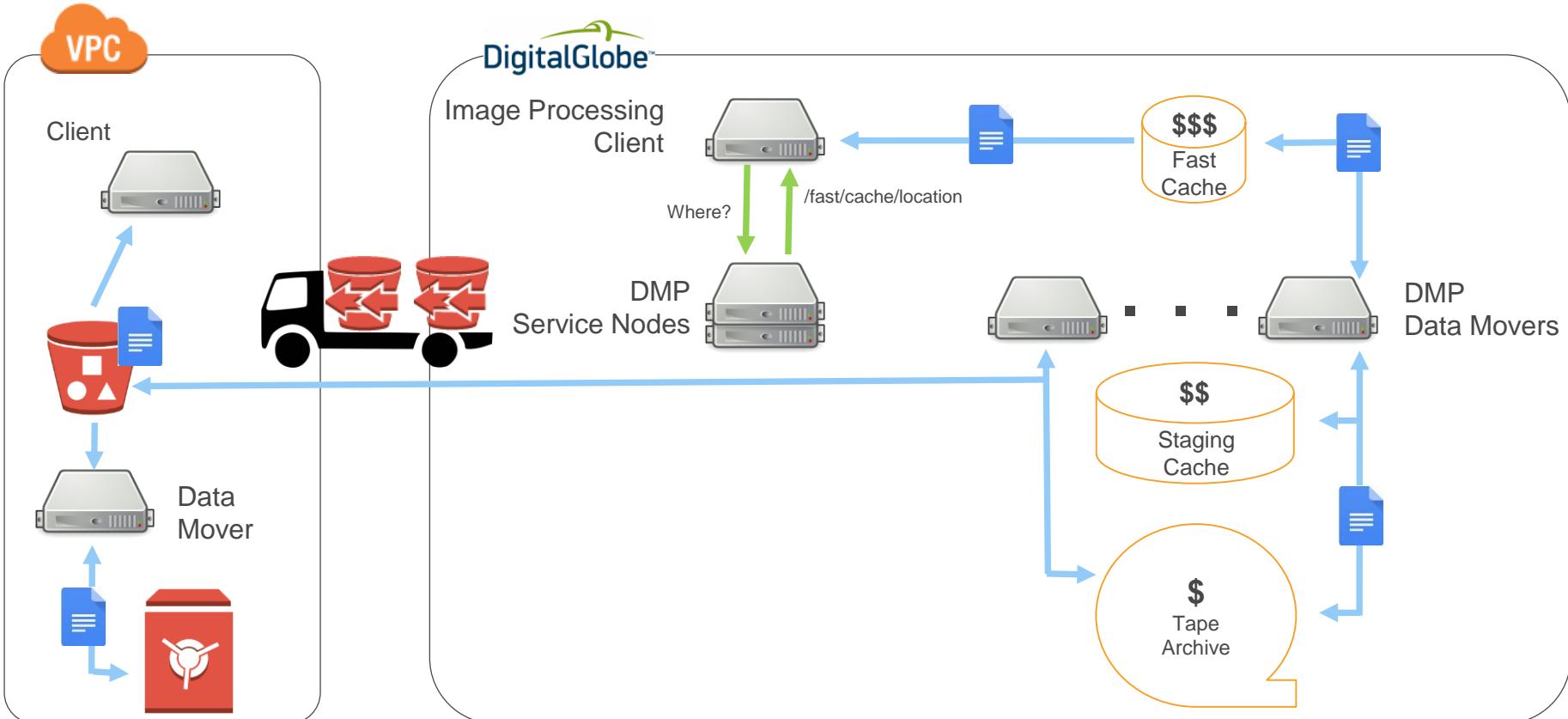
Release the images!

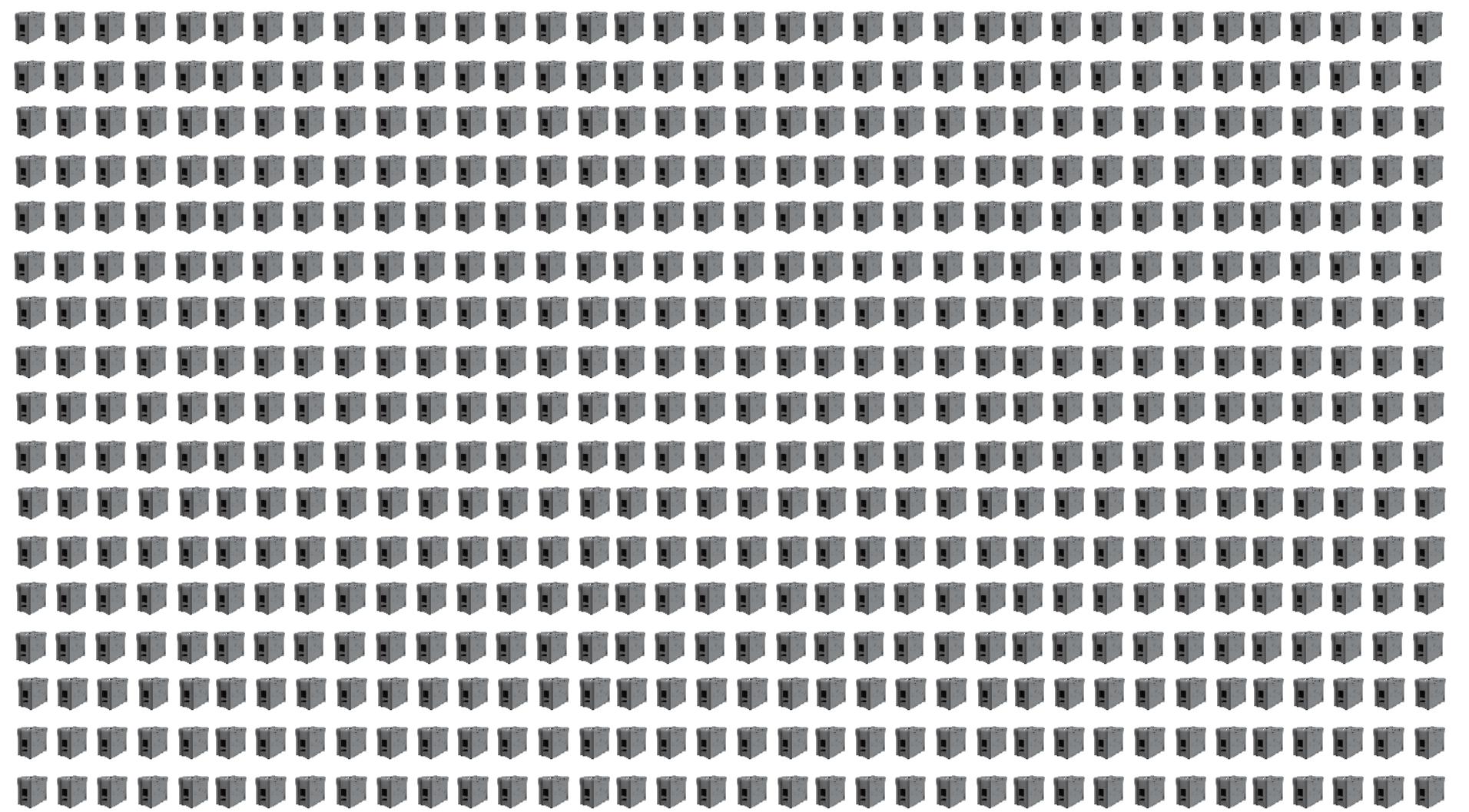


How? Snowball!



First stage booster: push *interesting* data sets to AWS via Snowball

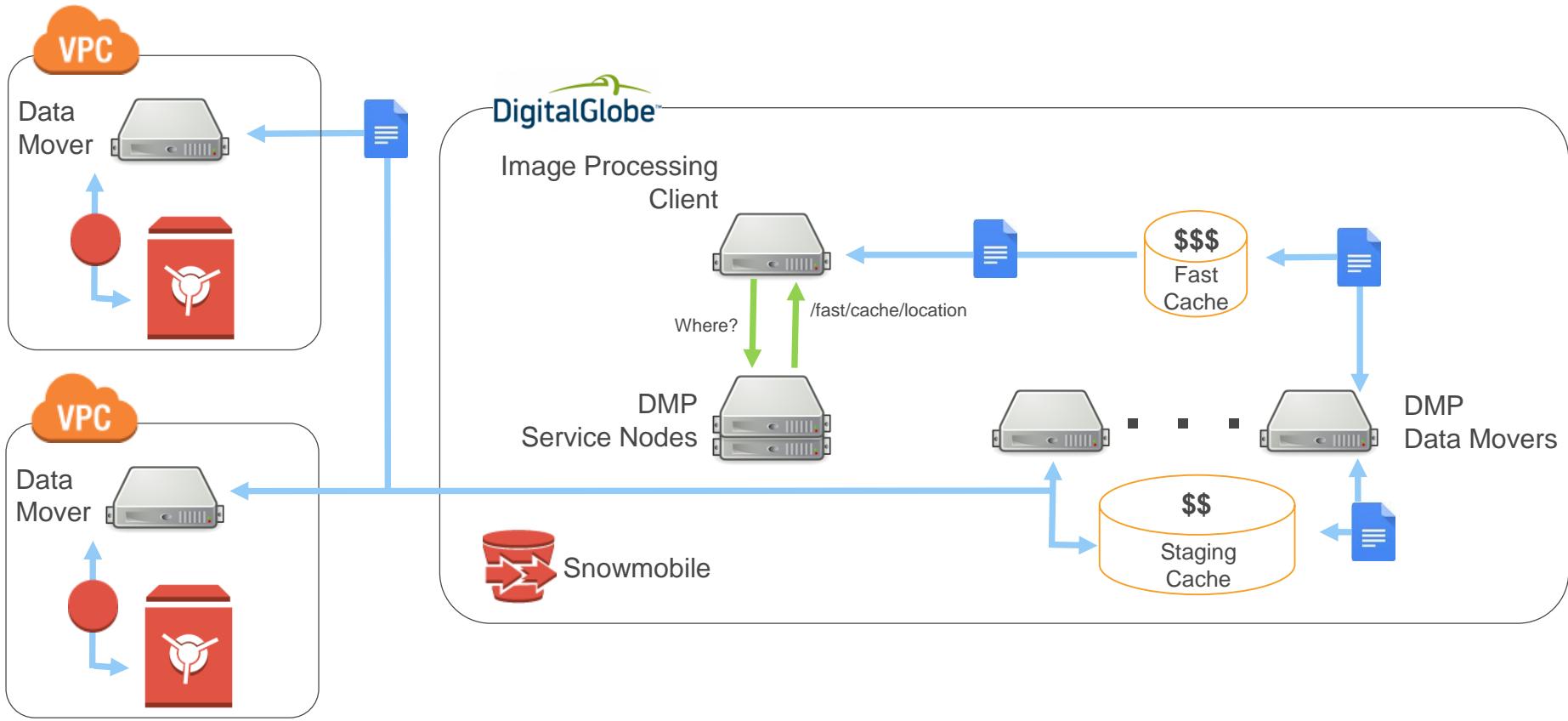






Clearly, we needed a bigger
Snowball. One visible from space.

Second stage booster: push *entire* wideband archive to Glacier vault via Snowmobile. No more tape robots!

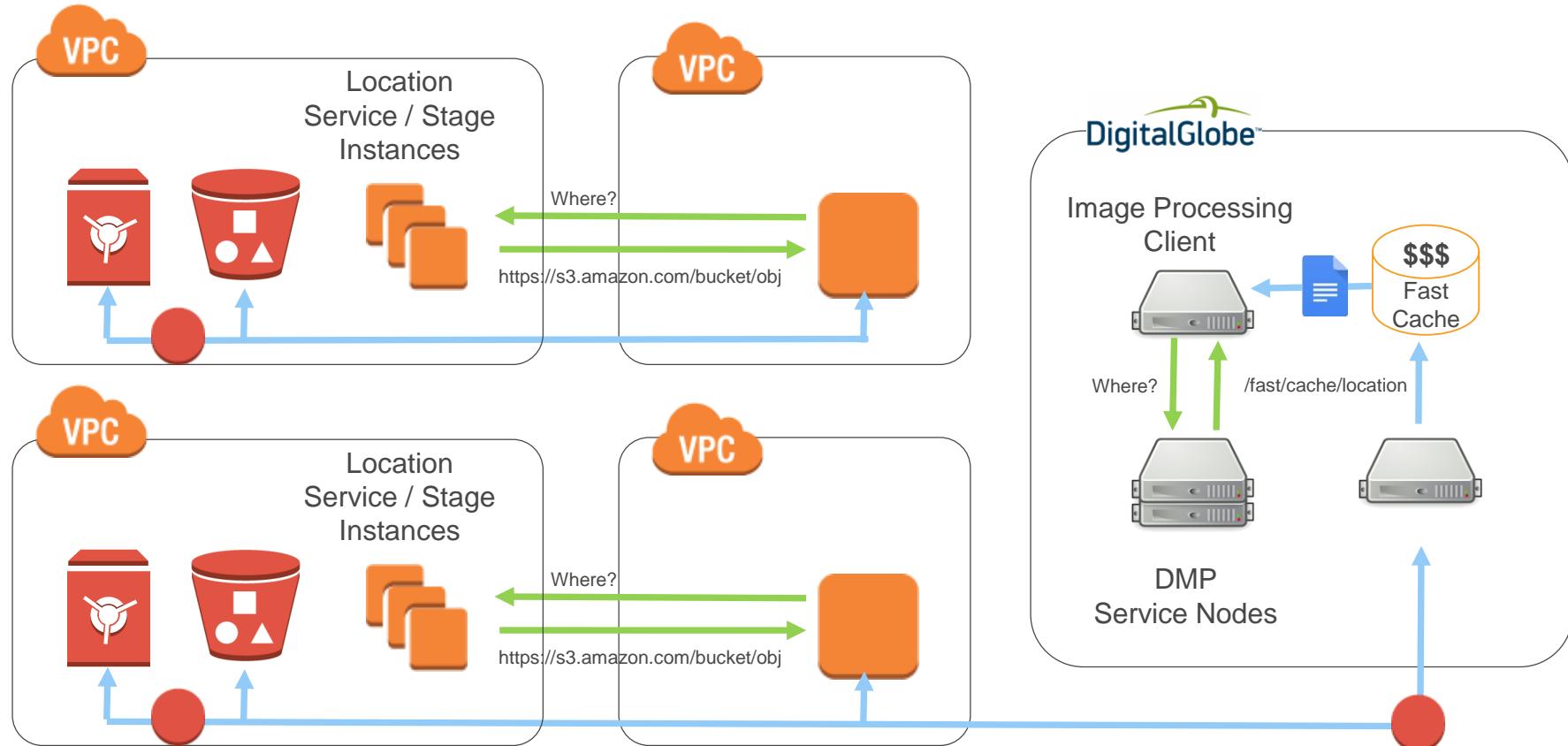


Lessons we are learning with Snowmobile

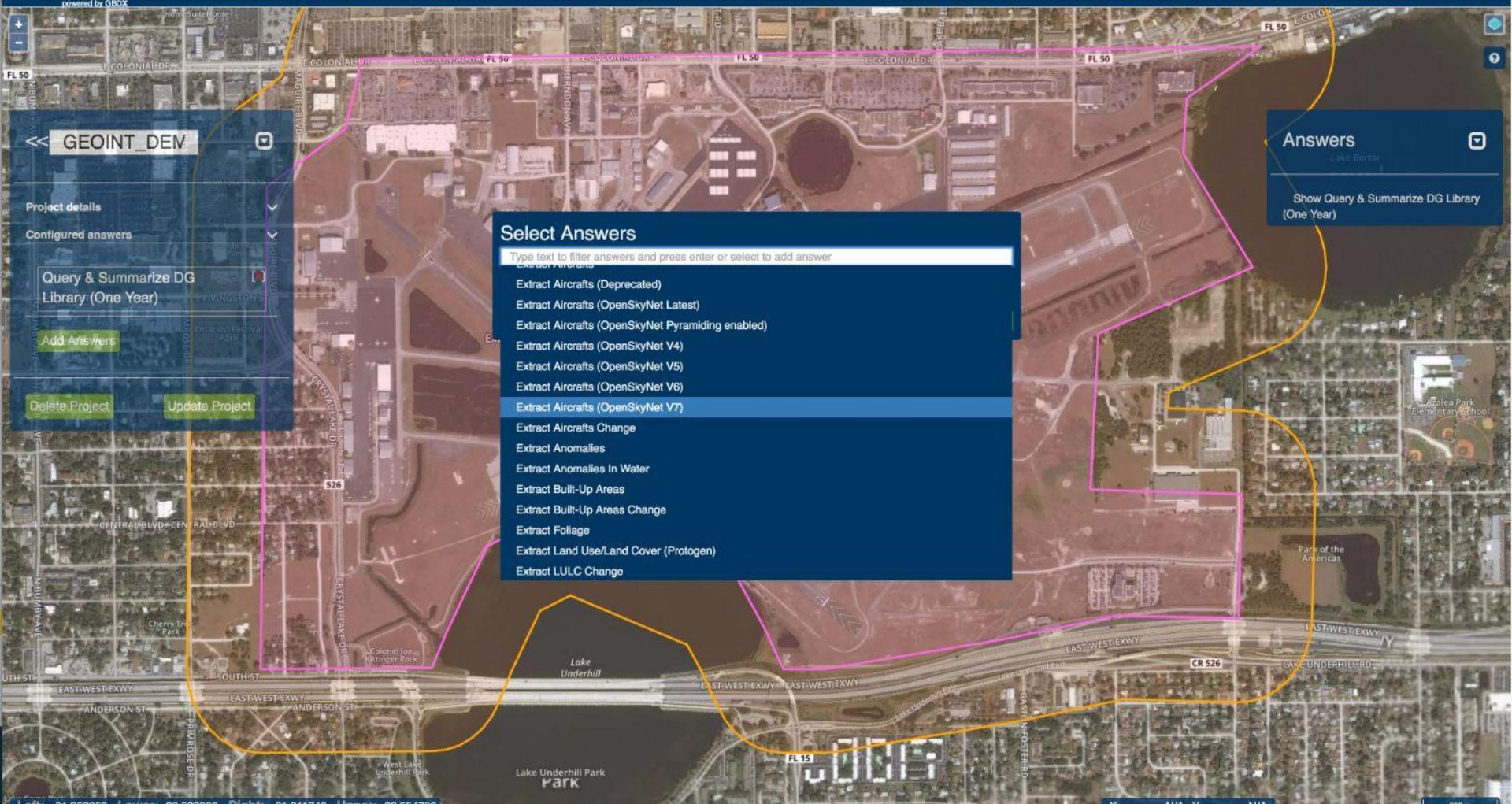
- This is not plug and play (yet)
- Pre-planning and coordination is critical.
- Understand payloads beforehand – a lot of tuning to optimized for our large files (i.e. data boulders from space)
- The secret sauce: Compute intensive translation between legacy file systems like ours and the data center on wheels



On orbit: Cloud-centric data management.

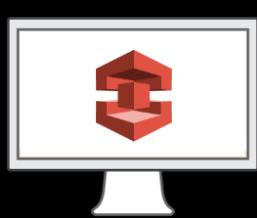


Learn more @ <http://blog.digitalglobe.com/2016/12/01/hauling-data-boulders-from-space/>



Challenges at the Edge

MISSION



Create job



Copy data

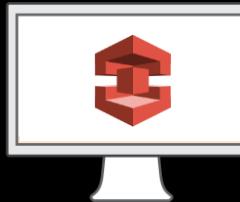


Moved to S3

COLLECTION



Collect data



Create job

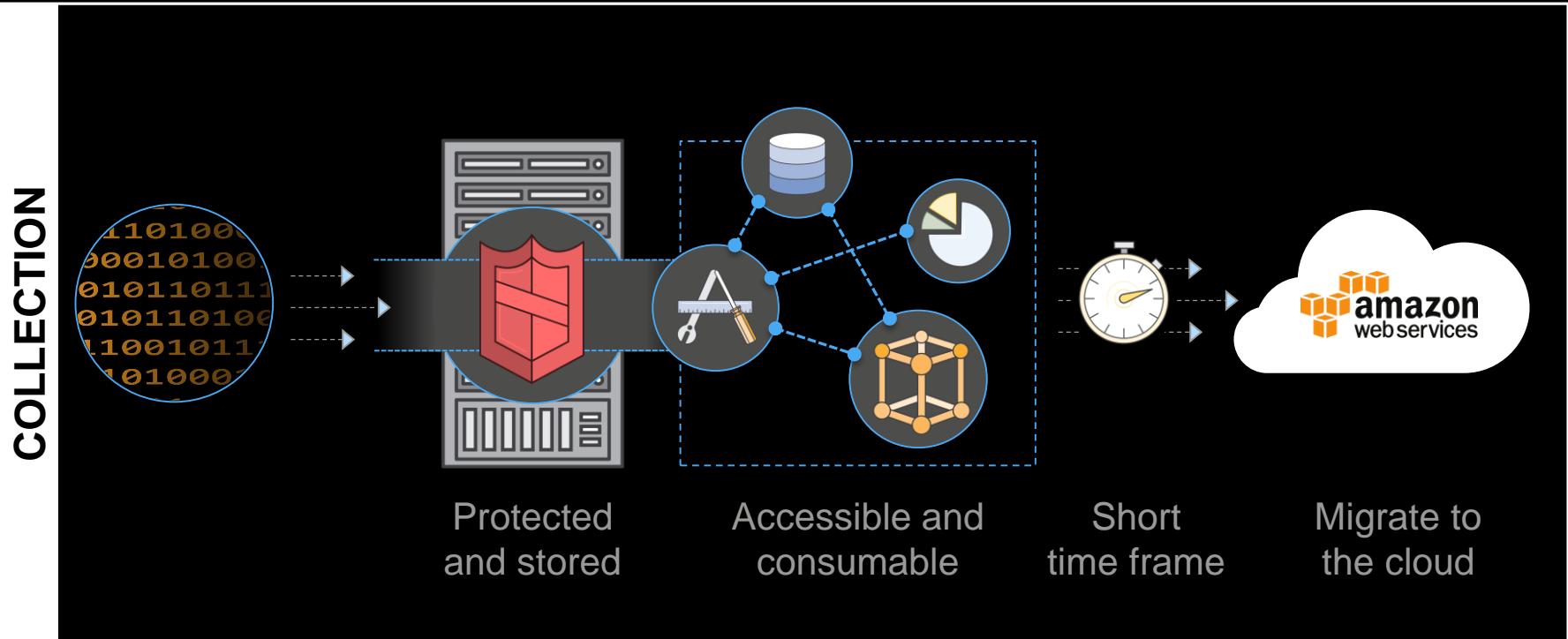


Copy data

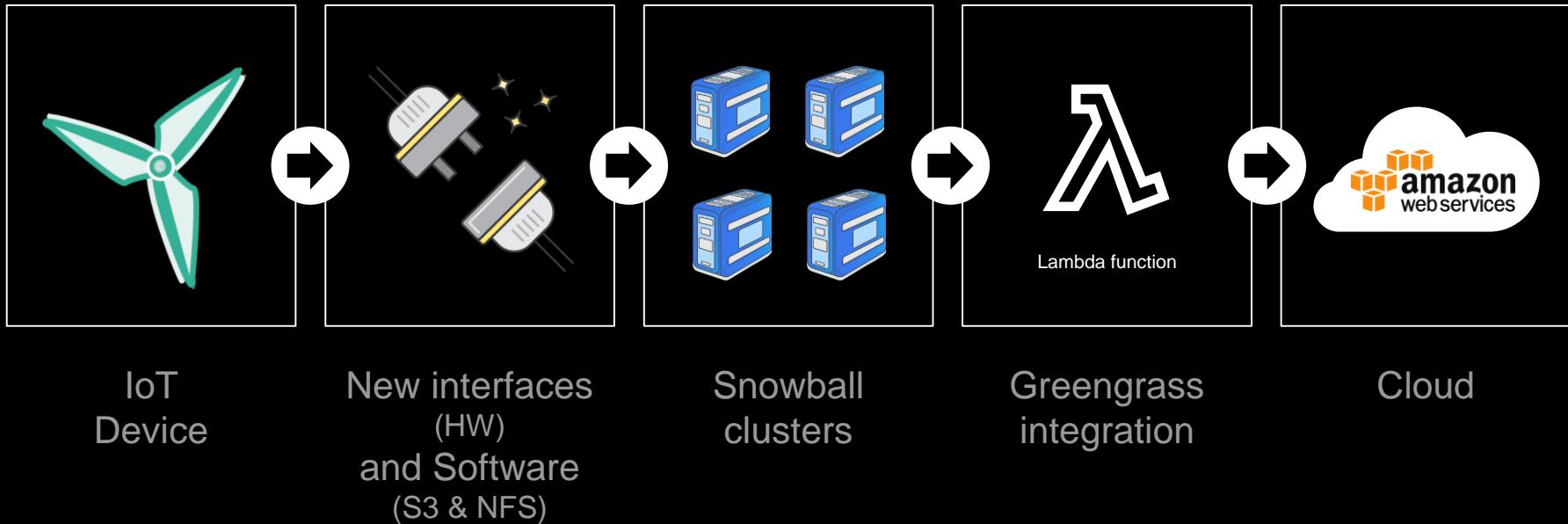


Moved to S3

Snowball Edge broad strokes



Snowball Edge broad strokes



Snowball Edge Key Features

Process data



Encrypted, secure,
and embedded
compute

Extension of your
data center



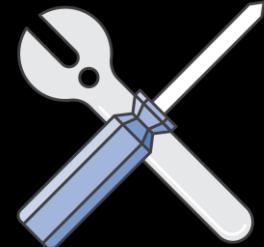
Write data directly
as data is generated

Expedites
move



Offers a fast and
cost effective way to
ensure data can be
quickly transferred to
and from the cloud

Simplifies
data transfer



Uses standard
and familiar tools
for the data
transfer process



Philips HealthSuite & AWS

Rich Ridolfo, Philips Healthcare

Philips HealthSuite & AWS

- What is HealthSuite?
- What are the challenges of IT in the Clinical Healthcare realm?
- Snowball Edge in HealthSuite



PHILIPS

Clinical Healthcare IT Challenges

Technology is now key to the delivery of care

- Reliability / Availability / Serviceability – Always Up
- Performance – 3 seconds or less [500MB – 2TB per object]
- Connectivity – Capacity and Reliability
- User Perception / Trust

Mitigation – On-site edge device

Connectivity

Broadband internet access remains a challenge through the US

Lack of access to broadband [25Mbps down / 3Mbps up] affects:

- 10% of all Americans (34 million people)
 - 39% of rural Americans (23 million people)
- 41% of Americans living on Tribal lands (1.6 million people)
 - 68% living in **rural areas** of Tribal lands (1.3 million people)
- 66% of Americans living on U.S. territories (2.6 million people)
 - 98% living in **rural areas** territorial areas (1.1 million people)

Desired Solution Characteristics

Survivability / Severability

Universal Codebase

End-to-end Security

Redundancy

Scalability

Single point of management

IntelliSpace Console Critical Care

What is it?

Patient Centered ICU Dashboard

FDA Class 2 Medical Device



- Visualization of data from many sources
- Clinical Decision Support & Error Prevention.
- Dynamic, Task Specific Data Displays
- Checklists & Smart Alerts
- Collaborative Workspace – Care Team, Patient & Family.

Philips IntelliSpace Console Critical Care HealthSuite + AWS Snowball Edge

IntelliSpace Console Critical Care

Aggregate over 1200 ICU patient data points per day

- Vital Signs
- Labs

Process – Compute – Predict

Present



Snowball Edge

Storage + Compute

Encrypted

Tamperproof

Redundant



PHILIPS

The Solution

Snowball Edge – Compute

- Running IntelliSpace Console Critical Care Execute λ for data transformation
- Real-time data analysis and results delivery
- Site Severability



Snowball Edge – Store

- DB Host
- Disk encrypted - security



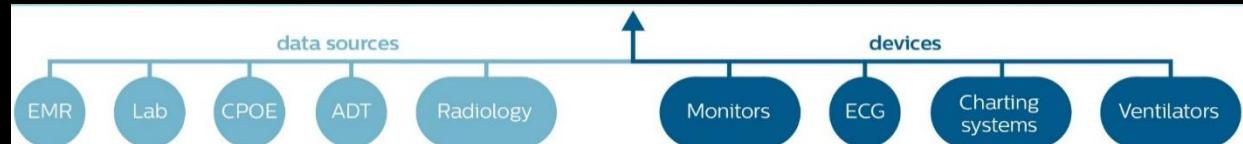
PHILIPS

Snowball Edge

On-site hub for communication, data aggregation & pre-processing.



Philips
HealthSuite



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Getting started

Learn more about Snowmobile and Snowball Edge

Snowmobile



[https://aws.amazon.
com/snowmobile](https://aws.amazon.com/snowmobile)

Contact
AWS Sales

Snowball Edge



[https://aws.amazon.
com/snowballedge](https://aws.amazon.com/snowballedge)

Go to the
management
console



KEEP
CALM
AND COME TO
OFFICE
HOURS

Storage “Office Hours”

Meet the People who Build AWS Storage

Who: Lead Software Development Engineers, Architects, and Technical PMs

Where: Storage Booth Walk-up Bar

When: Exhibit hours (Tues 5-7pm, Wed & Thurs 10:30a-6:00p)

What: Architecture best practices, code reviews, feature requests



Questions & Answers



Thank you!

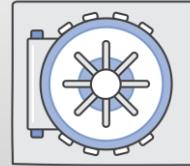


Amazon EFS

File



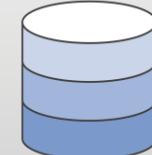
Amazon S3



Amazon
Glacier



Amazon EBS
(persistent)



Amazon EC2
Instance Store
(ephemeral)

