
AWS
re:Invent

WPS208

Drones and Snowballs: Delivering imagery at the edge

Grace Kitzmiller
Principal Product Manager
Disaster Response Program
AWS

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Agenda

Response in action with Help.NGO – improving situational awareness after Hurricane Dorian by processing imagery in the Bahamas with AWS edge compute

Unpacking the response – how the AWS Disaster Response program and AWS edge technology support across the disaster lifecycle

How to prepare – improving situational awareness in the field before a disaster occurs with AWS edge compute imagery processing exercise



© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.





Response in action with Help.NGO

Improving situational awareness after Hurricane Dorian by processing imagery in the Bahamas with AWS edge computing

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Supporting Help.NGO with AWS edge computing







Collect, store, analyze, and distribute imagery

Faster insights for local leaders

AWS Snowball Edge

Amazon S3, Amazon EBS, and Amazon EC2 AMIs

Open source maps

Drones (UAS)

Solution – AWS Snowball Edge

BRING THE CLOUD AND AWS TO REMOTE LOCATIONS WITH NO OR LOW NETWORK CONNECTIVITY

- Handles up to **200G impact**
- Can be airdropped
- MIL-S-901D
- Meets FISMA high, FedRAMP ITAR, CJIS, and DoD SRG Impact Level 6 requirements
- Has 40 TB of storage
- Has up to 200 GiB of memory



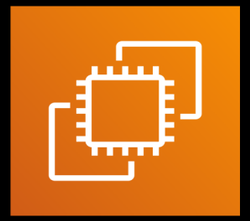
Tamper-resistant
Tamper-evident

Operates on unconditioned power and in harsh environments (0° to 45°C)

- Data secured with military-grade encryption
- Designed to be operated by non-technical personnel

Weighs ~22 kg – can be handled by a single person

AWS Snowball Edge – key AWS services



Amazon EC2



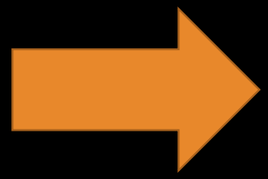
AWS Lambda



Amazon S3



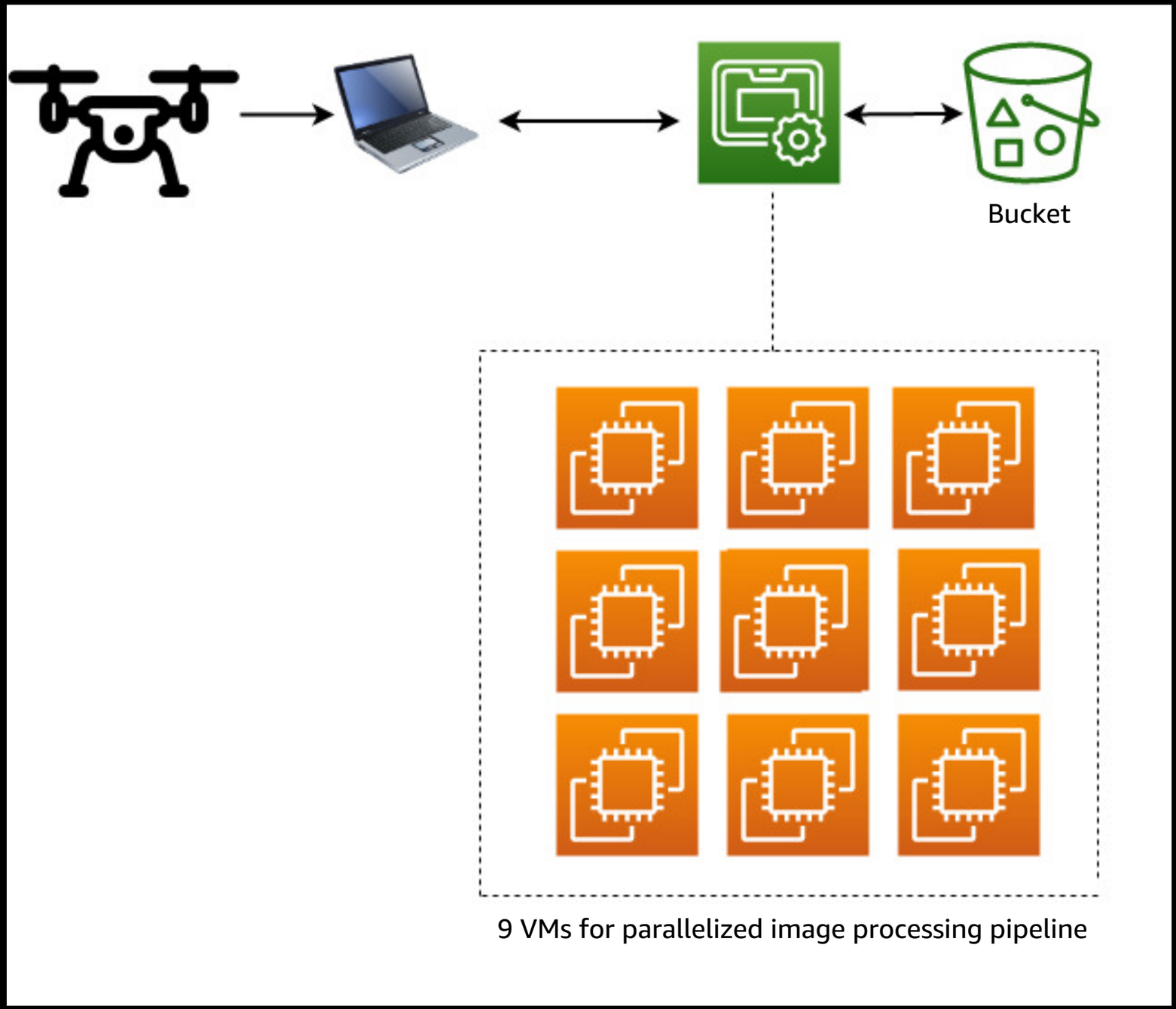
Amazon EBS





AWS Snowball Edge

Help.NGO solution architecture



“Leveraging Snowball Edge technology, Help.NGO and AWS Disaster Response personnel were able to rapidly streamline the production and distribution of high-resolution UAS imagery. Its rugged capacity brought cloud to the edge for our team, allowing real-time data processing and the rapid provisioning of mission-critical data to humanitarian decision makers.”

Brendan Harvey

Executive Director
Help.NGO



© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

What is the AWS Disaster Response Program?

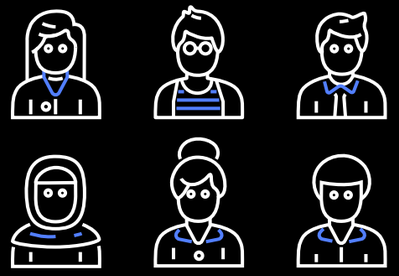
How the AWS Disaster Response program and AWS edge technology support across the disaster lifecycle



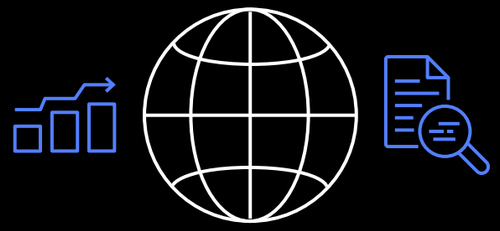
AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

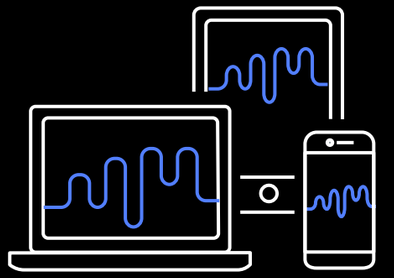
What is the AWS Disaster Response Program?



People



Information



Technology

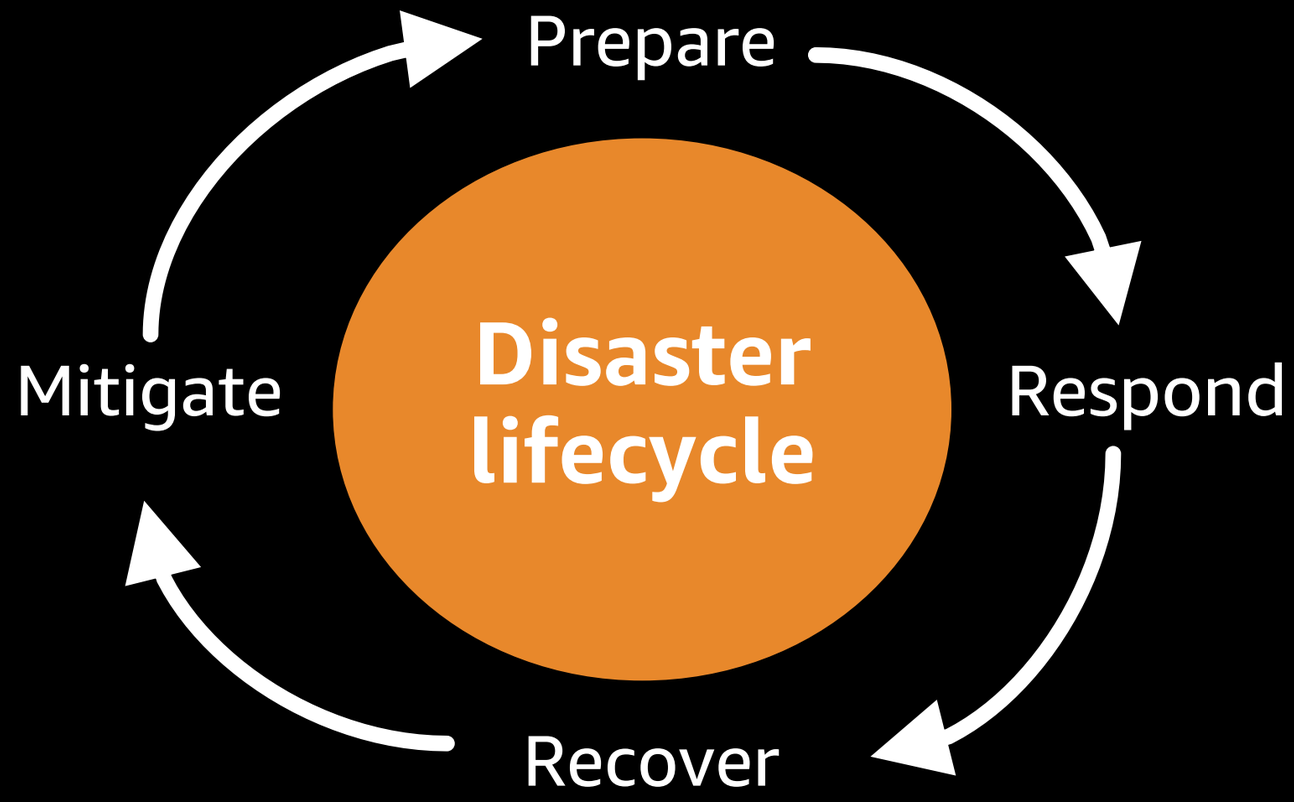
What we do – service, deploy, and support

Why we do it – preparedness, investment, partnership, and philanthropy

When we do it – severe events and onboarded customers

How we do it – technical and virtual volunteers certified in National Incident Management Systems (NIMS), first aid / CPR, and field training exercises

What is the disaster lifecycle?



How to prepare

Improving situational awareness in the field before a disaster occurs with an AWS edge compute imagery processing exercise



AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Preparing for disaster response

Assessing hard-to-reach areas and damage to buildings, roads, crops, and other resources by capturing and processing drone imagery in days rather than weeks

- Remote environment in rural Africa with significant flood history and risk
- Low or no connectivity
- Limited power supply



Questions to ask when preparing for a response

What are the most common types of disasters or humanitarian needs you respond to?

What data will you need? Can you access this data when and where it is needed if connectivity is limited or lost?

What apps or solutions will you need to access, with or without connectivity?

What data do you typically collect after a disaster?

What kinds of data analyses will help inform situational awareness and decision making?

Solution requirements

- Large storage volume
- Run apps for drone / UAV imagery processing and viewing
- Operate in limited power, limited connectivity conditions
- Portable and ruggedized; dust resistant
- Provide access to street and building mapping imagery
- Easily accessible to multiple laptops at the same time





Solution – AWS Snowball Edge

BRING THE CLOUD AND AWS TO REMOTE LOCATIONS WITH NO OR LOW NETWORK CONNECTIVITY

- Handles up to **200G impact**
- Can be airdropped
- MIL-S-901D
- Meets FISMA high, FedRAMP ITAR, CJIS, and DoD SRG Impact Level 6 requirements
- Has 40 TB of storage
- Has up to 200 GiB of memory



Tamper-resistant
Tamper-evident

Operates on unconditioned power and in harsh environments (0° to 45°C)

- Data secured with military-grade encryption
- Designed to be operated by non-technical personnel

Weighs ~22 kg – can be handled by a single person

AWS Snowball Edge in action









AWS Management Console

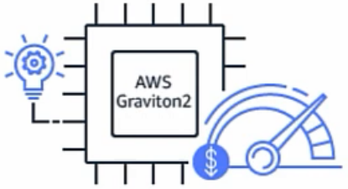
Everything you need to access and manage the AWS cloud — in one web interface.

Log back in

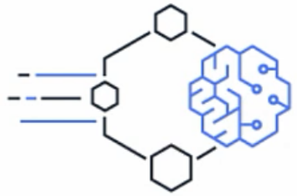
Explore more from AWS



RDS Read Replicas
Achieve scale and low-latency for read-heavy workloads with RDS Read Replicas.
Learn more >>



AWS Graviton2
Up to 40% better price performance with AWS Graviton2 based Amazon EC2 instances.
Learn more >>



Learn all about ML with Amazon SageMaker
Remove the heavy-lifting from the ML process and build ML models quickly and easily with Amazon SageMaker.
Learn more >>



Amazon EC2 Spot Instances
Reduce your Amazon EC2 costs by up to 90%.
Learn more >>

Build with AWS

aws



AWS OpsHub for Snow Family

Manage your Snow Family devices and local services.



Select your device

Pick which device configuration you want to set up.

- (●) **Snowcone**
  Set up an individually provisioned Snowcone. Snowcone is available in select AWS Regions.
  
- ( ) **Snowball Edge**
  Set up an individually provisioned Snowball device.
  
- ( ) **Snowball Edge Cluster**
  Set up a group of devices that have provisioned together as a cluster.
  

Next

This field test demonstrated that using an AWS Snowball Edge device to process drone imagery in hard-to-reach areas with poor connectivity can reduce storage and processing time from weeks to less than one day



© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.



The AWS Disaster Response program provides support to global communities and customers worldwide in solving technology challenges related to natural disasters and crises. We support customers at every stage of the disaster lifecycle.

For more information, visit our web page or contact us directly at aws-drp@amazon.com

Thank you!



AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.



Please complete the session survey

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.