AWS Snow Family:

Edge Computing Innovations & Best Practices

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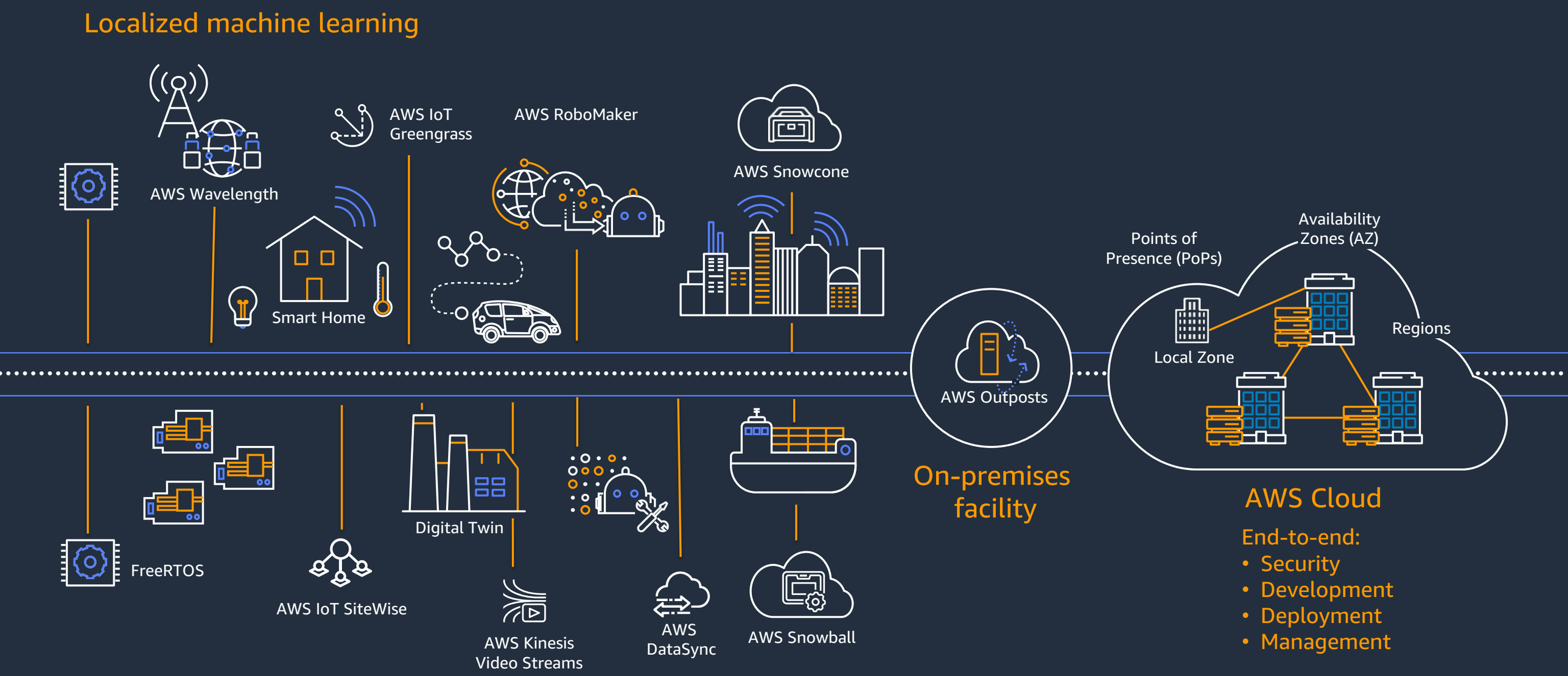
Edge to cloud continuum



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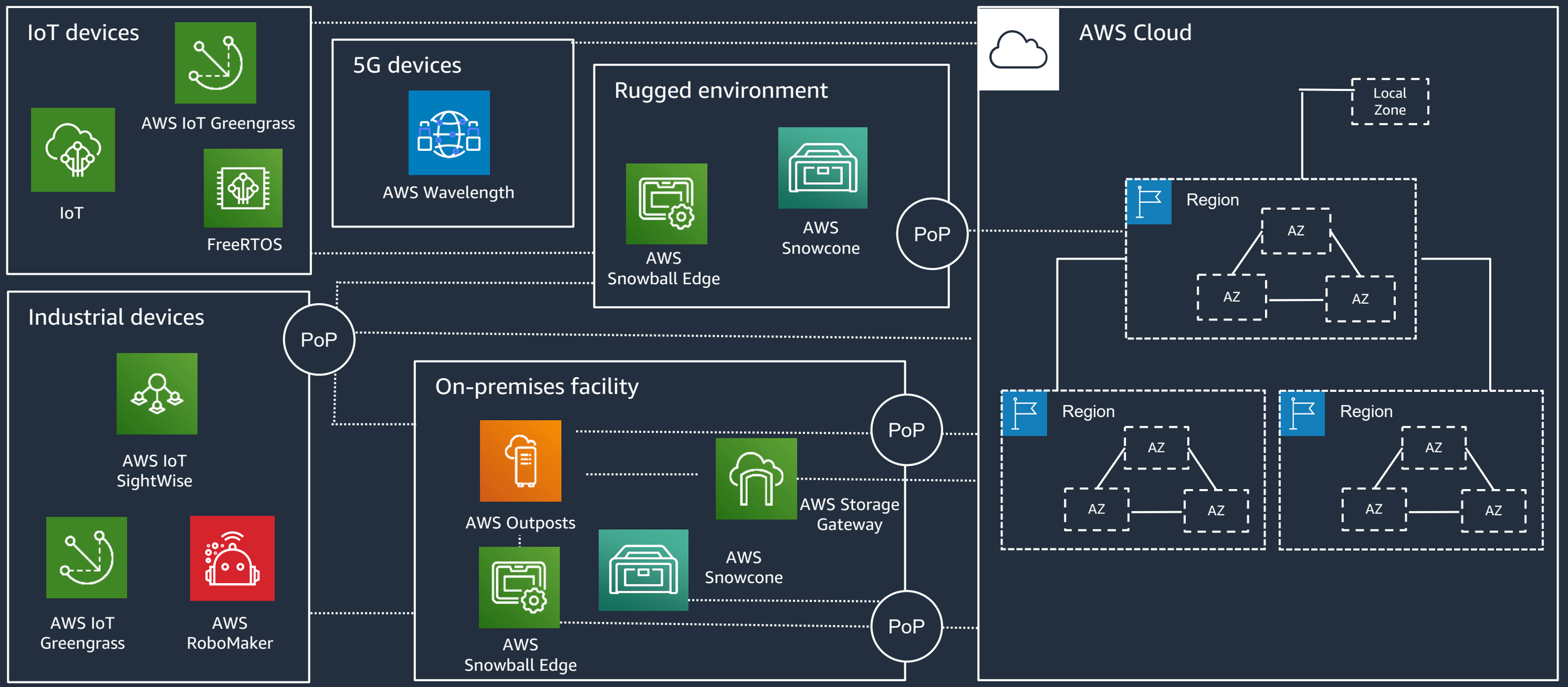
Edge to cloud architecture



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Working with edge devices is challenging

Law of
physics

Law of
economics

Law of
the land

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The AWS Snow Family evolution

Data movement

Edge computing

Customer sites

Edge sites

- Set of services and functionality on the partially- to fully-disconnected and secure edge
- Enables data collection, data processing, and data movement from the Edge to AWS

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Introducing AWS Snowcone

Small, portable, rugged, and secure edge computing and data transfer device

- Military-grade security
- 4.5 pounds (2.1 kg)
- Portable computing, anywhere
- Withstands harsh environments
- Offline & online data transfer
- 8 TB of storage
- 2 CPU, 4 GB compute

Use cases

Industrial IoT, healthcare IoT, content distribution, content aggregation, data migration, logistics, autonomous vehicles, and transportation

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AWS Snowcone

Easy to use with AWS OpsHub

Offline Import/Export to Amazon S3, Online Import/Export to Amazon S3, Amazon EFS, and Amazon FSx for Windows File Server with AWS DataSync

802.1x Wi-Fi connectivity

Compute capability:
2 CPU X86 at 2.2 GHz,
4 GB RAM

8 TB of connected storage (Ethernet, and Wi-Fi. NFS data copy)

EC2 Computing or AWS IoT Greengrass functions

Data secured with military-grade encryption

Anti-tamper & Tamper-evident enclosure

4.5 lbs (2.1 kg)
Portable carry
(backpack, drone, etc.)

Operates on unconditioned power and in harsh environments from freezing (0°C/32°F) to desert-like conditions (38°C/100°F)

Supports operation via battery for mobility

Rugged, dust-tight, water and wind resistant

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AWS Snowcone portable edge processing scenarios

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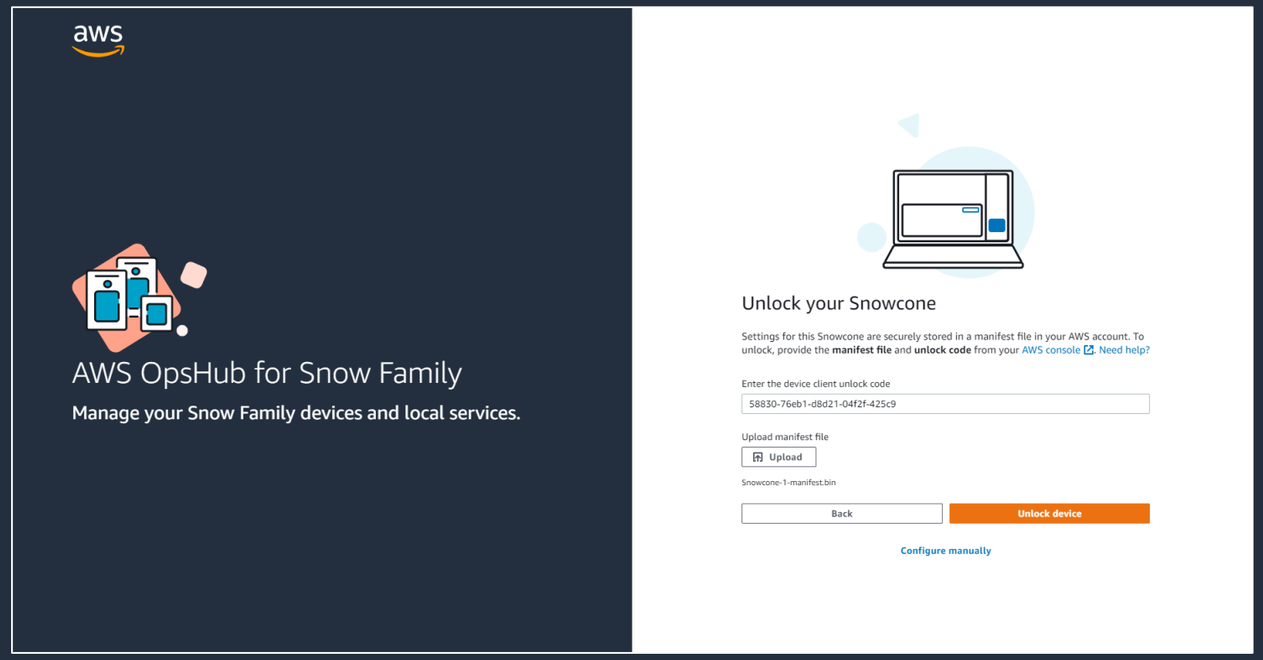
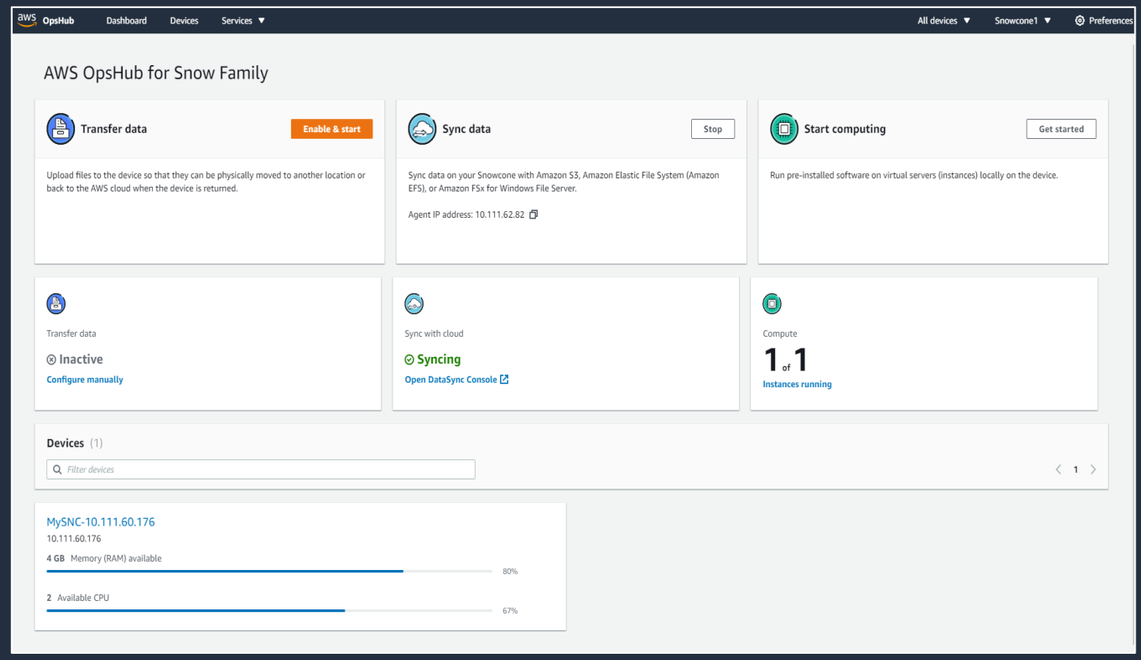
AWS OpsHub for Snow Family

GUI for customers to manage Snow devices





[Visit the AWS Snowcone resources page to learn more about AWS OpsHub »]

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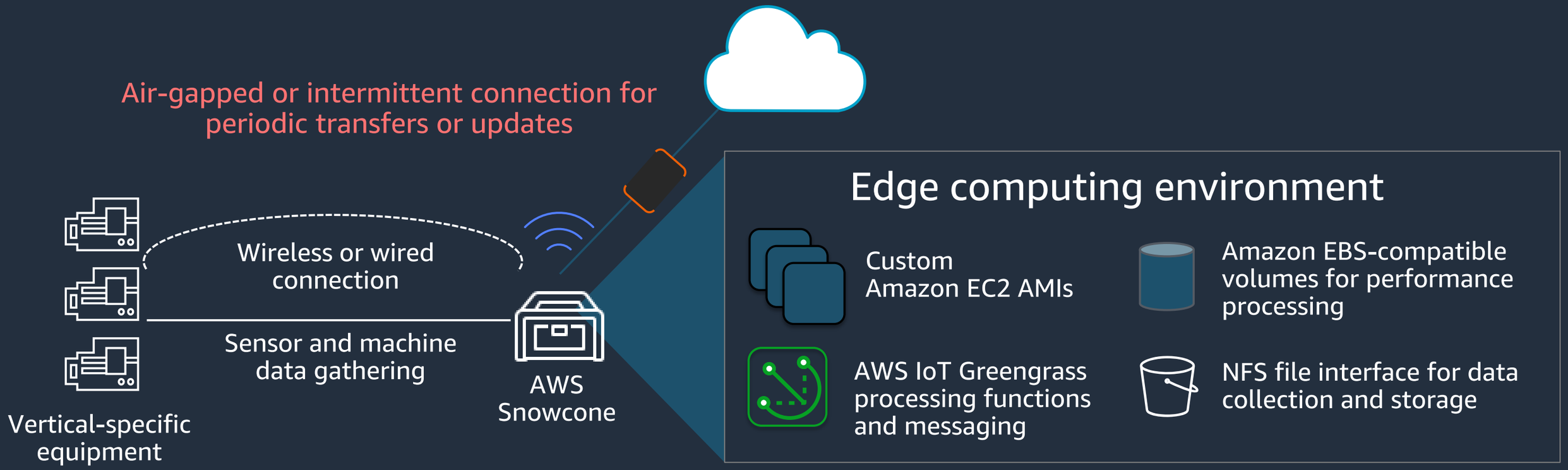
Edge computing example workflow



Benefits

- Hardened, secure, and highly performant computing outside of the data center suitable for hot factories, facilities with variable security
- Collect, analyze, and enable local actions faster
- Consistent programming and DevOps model: Develop & test in-cloud, run at the edge
- AWS delivery model: Hardware-as-a-service

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Snowcone Customer Use Cases

Industrial IoT

- Factories, mines, oil fields, and pipelines are instrumented with IoT
- Snowcone's compact and ruggedized design allows for use in industrial and austere locations
- Process the collected data with AMIs running on EC2 or with AWS IoT Greengrass functions

Content Distribution

- Distribution of media, scientific, or other content from AWS
- Offline or Online with DataSync
- Deluxe's One VZN distributes content online from Amazon S3, using AWS DataSync, to AWS Snowcone devices in theater locations

Healthcare IoT

- Snowcone can be used for data collection and processing in healthcare facilities or in remote medical areas
- Crucial data can be transmitted from emergency vehicles in real-time
- Snowcone provides a path for HIPPA compliant data to AWS

Content Aggregation

- Aggregation of media, scientific, or other content from multiple locations to AWS
- Offline or Online with DataSync
- Customers can transfer content from their customers, partners, or from multiple edge locations and aggregate them in AWS

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Connecting the Edge to the Cloud with Snowcone

"One VZN is a leap in innovation for digital cinema distribution, fundamentally changing not only the economics of film distribution for exhibitors and studios around the globe, but enabling new theatrical experiences for viewers. The combination of AWS Snowcone, AWS DataSync, and Amazon S3 are essential to One VZN – the collective services distinguish themselves from any other cloud offerings today."

Andy Shenkler, Chief Product & Technology Officer of Deluxe

Blog:
Deluxe enables same day global theatrical delivery using AWS Snowcone »

"AWS is leading in the development of practical, mission-ready edge computing technology that we use to build solutions to help our public sector clients save lives, AWS Snowcone is a great example of AWS innovation for the edge. Snowcone gives us a rugged, secure, and portable edge computing platform that we can use in disaster zones and austere edge locations. In our recent field exercises, Snowcone performed admirably as a sensor hub at the edge for tracking people and assets in a disaster zone."

Rob Sheen, SVP Client Operations at Novetta

Blog:
Novetta delivers IoT and Machine Learning to the edge for disaster response »

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Edge Computing:
AWS Snowball Edge

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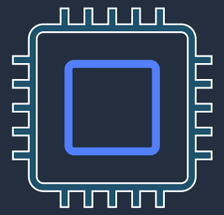
2 Snowball Edge options



Compute optimized

- 42 TB usable S3 compatible storage
- 52 vCPUs, 208 GiB of memory
- Optional NVIDIA Tesla V100 GPU
- sbe-c and sbe-g instances (equivalent to C5, M5a, G3, P3)

Storage optimized

- 80 TB usable S3-compatible storage
- sbe1 instances (equivalent to C5)
- Up to 40 vCPUs, 80 GiB of memory, 1 TB SATA SSD
- Object storage clustering available

Long-term deployment options: 1- and 3-year discounted pricing

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Changing the way the intelligence community moves data

12 million images

Reduced timelines

Automated extractions

50 million indexed observations

75% automated

Automate imagery observations

Automate text reports related to those observations

NATIONAL GEOSPATIAL NGA INTELLIGENCE AGENCY

Approved for public release, 19-132

Excerpted from AWS re:Invent session: National Geospatial-Intelligence Agency: Changing the Way the Intelligence Community Moves Data – WPS315, led by Timmy Richardson, Nov 2018 https://youtu.be/KXelfBpJtDY

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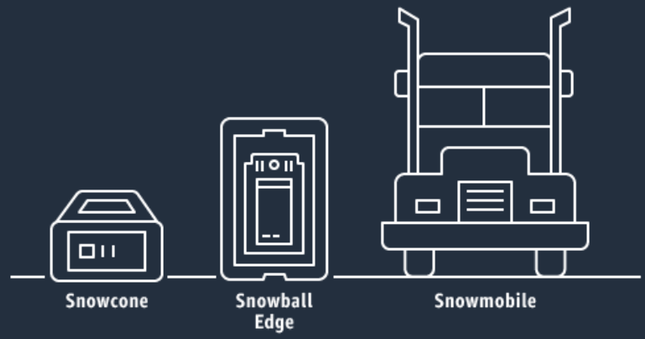
Data Movement:
AWS Snow Family



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Data collection and movement challenges

	Time to transfer		
	@100Mbps	@1Gbps	@10Gbps
10 TB	12 days	30 hours	3 hours
100 TB	124 days	12 days	30 hours
1 PB	3 years	124 days	12 days

Limited online data transfer options due to:

- Connectivity limitations
- Bandwidth constraints
- High network connection costs
- Legacy environments
- Data properties and usage patterns
- Data collected in remote / austere locations

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AWS Snow Family for data collection & data movement

	Snowcone	Snowball Edge Storage Optimized	Snowmobile
Migration size	Up to 24 TB, online and offline	Up to petabytes, offline	Up to exabytes offline
Form factor	Rugged 8.5 G impact cases that are rain and dust resistant, E Ink label for shipping automation		45-foot container, scheduled delivery
Security	256-bit encryption, tamper detection		Encryption, security staff, GPS tracking, video surveillance, alarms
Storage capacity	8 TB usable	80 TB usable	<100 PB
DataSync agent	Pre-installed	-	-
Compute	2 vCPU, 4 GB RAM usable	40 vCPU, 80 GB RAM, 1 TB SSD usable	-
Onboard computing options	AWS IoT Greengrass functions Amazon EC2 AMIs		
Wireless	Wi-Fi	-	-
Portable or Mobile use	Battery based operation	-	-
Clustering	-	Up to 15 nodes	-

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Visit the AWS Snow Family page for a more detailed comparison »

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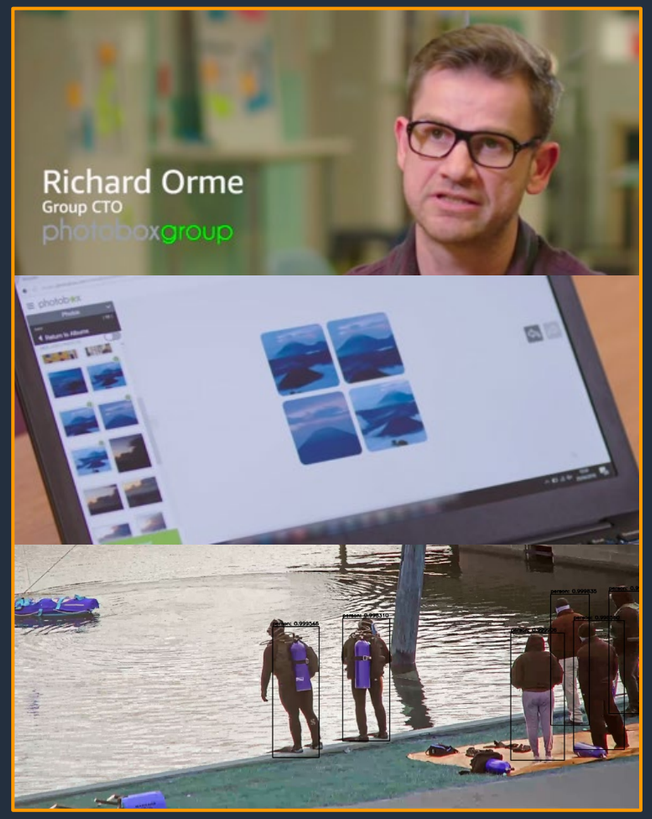
Data migration at scale with Snowball Edge

PHOTOBOX



Europe's #1 online photo service

Migrated to AWS from two data centers

- Used Snowball Edge to move 10 PB (5.7 billion) of photos from Dell EMC Isilon and IBM Cleversafe to Amazon S3
- Needed S3 data durability; higher than colos and other clouds

Shifted investments and focus to innovation and product development for customers, away from IT infrastructure

> "We've reduced costs. We've improved our customer experience. Generally, we've made our website faster. And that's because AWS manages that infrastructure in a way we could never do internally."
>
> **— Chris Astall, Group Director of Architecture**
> aws.amazon.com/solutions/case-studies/photobox/

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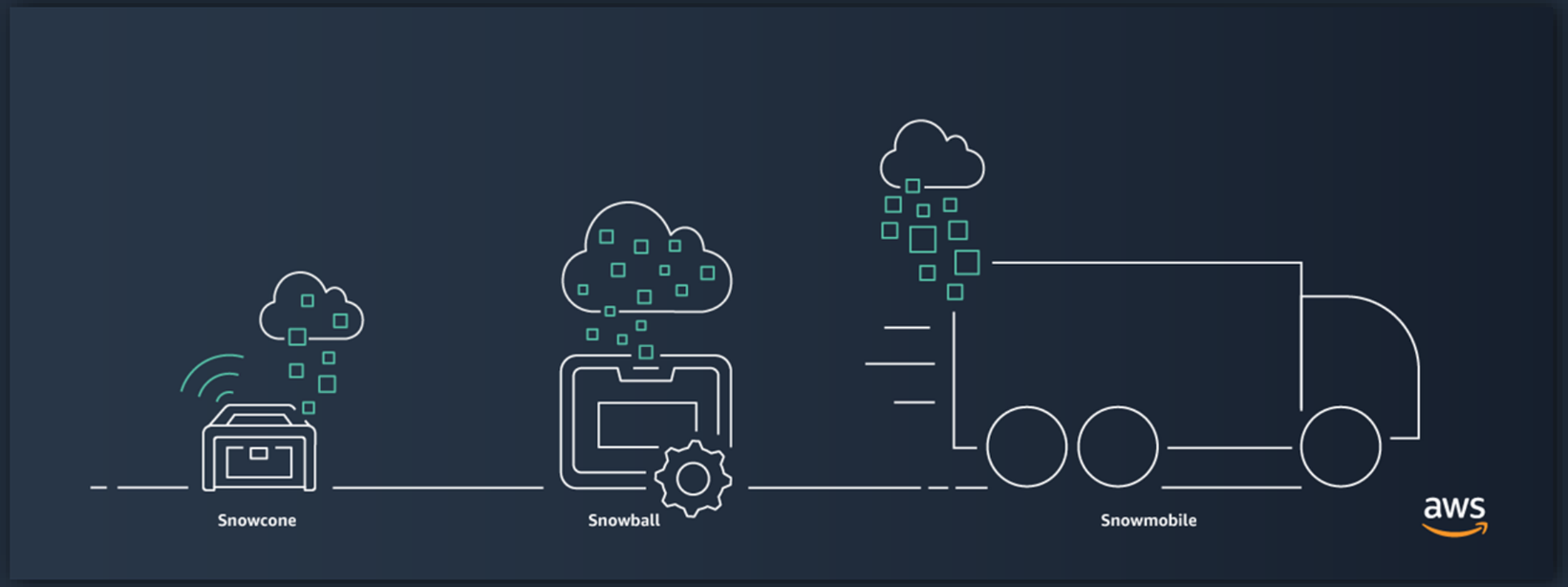
Thank You / Q & A



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