IOT301

Building an IoT SuperNetwork on top of the AWS Global Infrastructure

Daniel Lemke
Sr. Solutions Architect
Amazon Web Services

Dr. Steffen Gebert
Director Technology, Infrastructure
emnify GmbH

emnify

Agenda

Cellular Device Connectivity Pain Points

AWS Global Infrastructure

emnify's IoT SuperNetwork on AWS

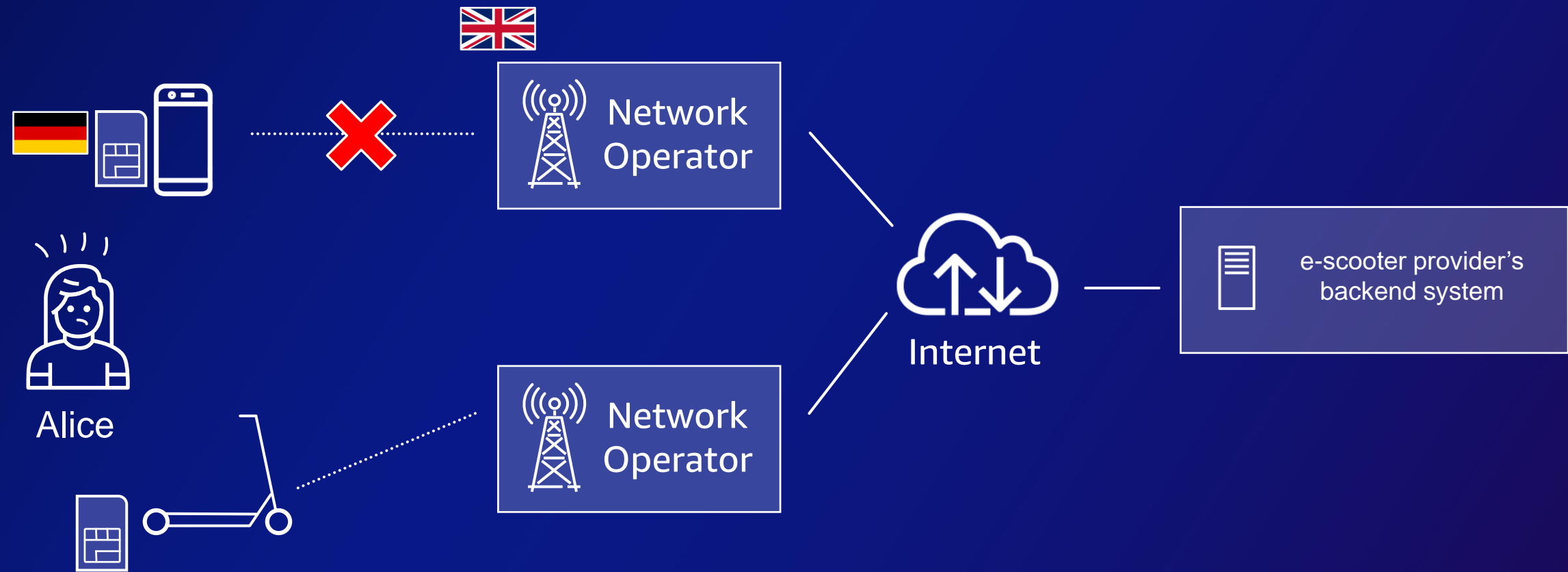   Platform Overview

      Connectivity Architectures

Key Takeaways

emnify

Cellular Connectivity:
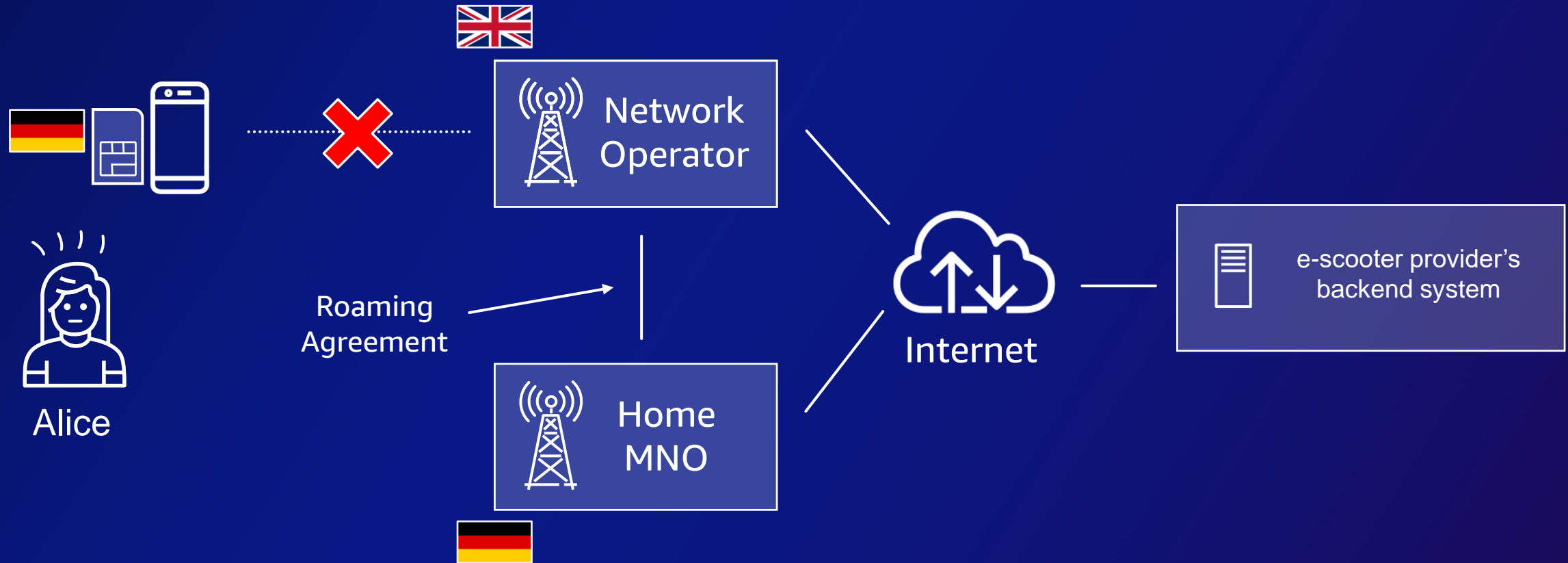# The Customer's Pain Point

Cellular Device Connectivity

THE CUSTOMER'S PAIN POINT

Cellular Device Connectivity

THE CUSTOMER'S PAIN POINT
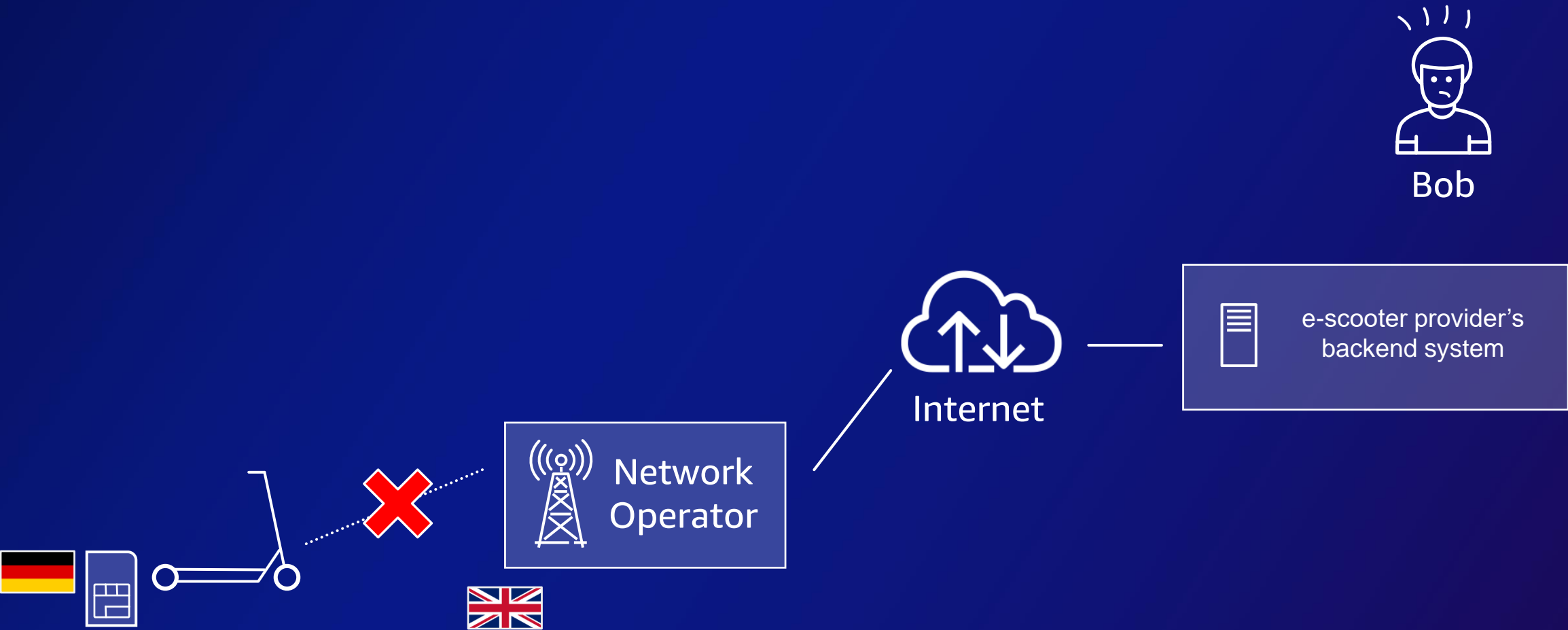

MNO = Mobile Network Operator (i.e. a telco company)

Cellular Connectivity:
The IoT Fleet Operator's Pain Point

Cellular Device Connectivity

IOT FLEET OPERATOR'S PAIN POINT

Bob

e-scooter provider's backend system

Internet

Network Operator

aws

emnify

Cellular Device Connectivity

IOT FLEET OPERATOR'S PAIN POINT

MNO = Mobile Network Operator (i.e. a telco company)

Cellular Connectivity:
The Mobile Network Operator's
Pain Point

Cellular Connectivity

THE MOBILE NETWORK OPERATOR'S PAIN POINT

MNO = Mobile Network Operator (i.e. a telco company)

Cellular Connectivity

THE MOBILE NETWORK OPERATOR'S PAIN POINT

Visited MNO
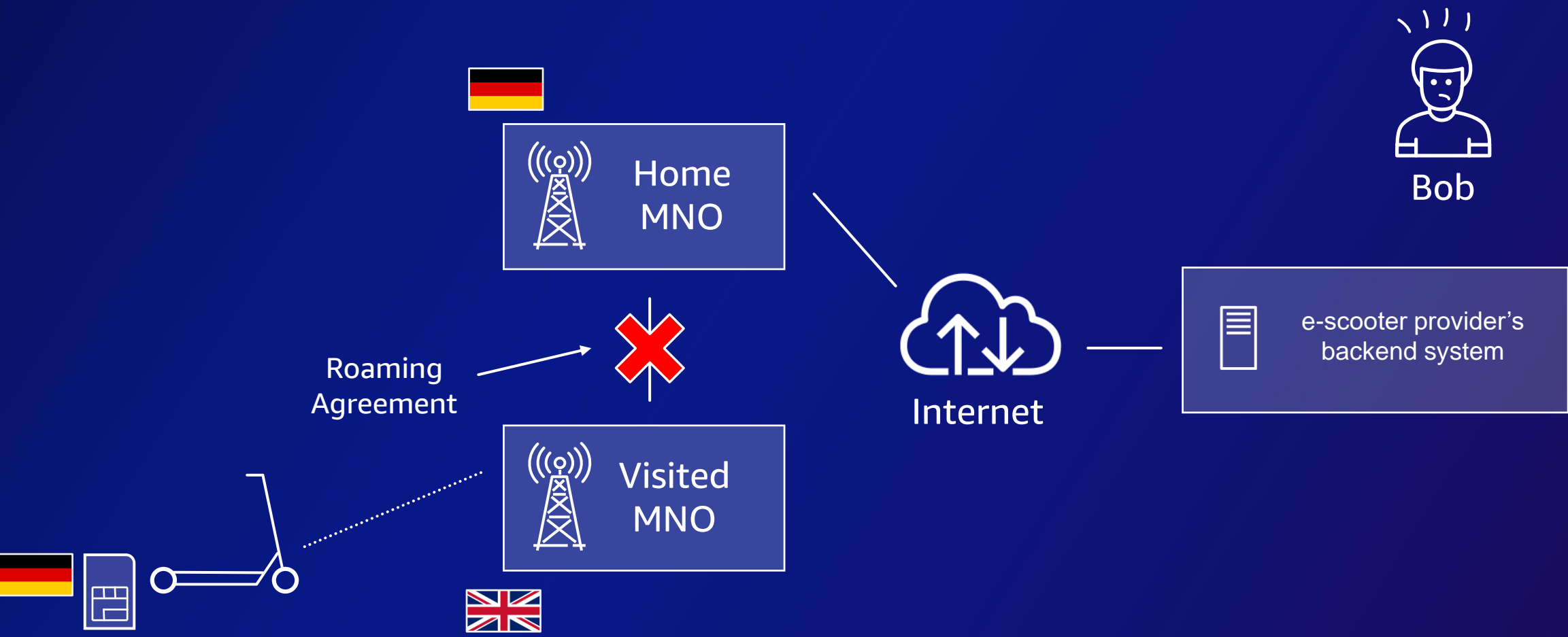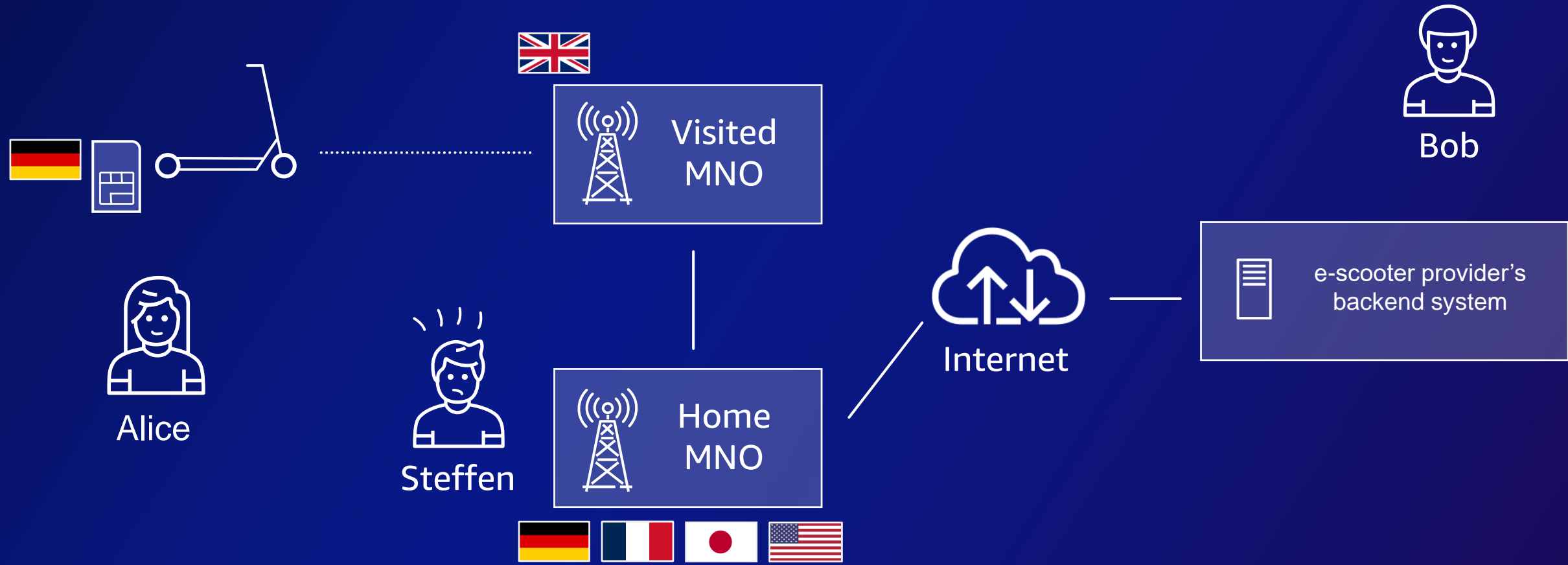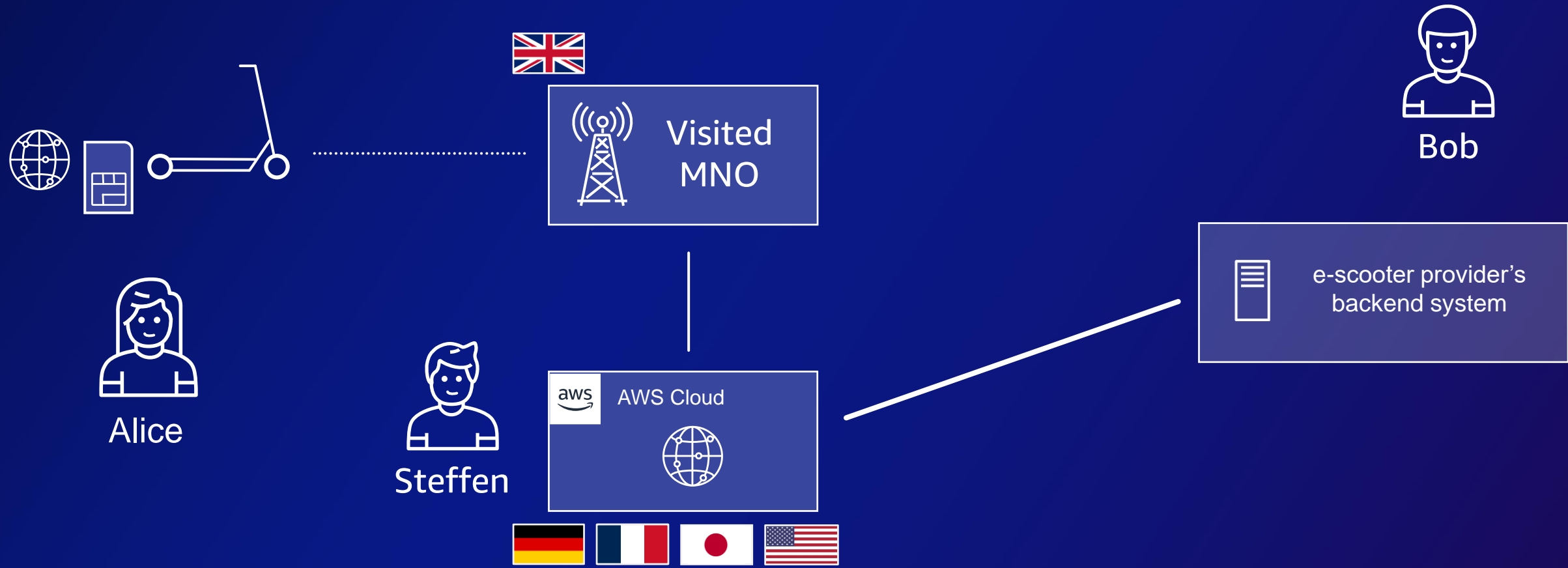
Bob

e-scooter provider's backend system

Alice

Steffen

AWS Cloud

MNO = Mobile Network Operator (i.e. a telco company)

AWS Global Infrastructure

31 LAUNCHED REGIONS, 99 AVAILABILITY ZONES AND 450+ POINTS OF PRESENCE

United States

GovCloud (U.S.):
U.S.-East (3), US-West (3)

U.S. West
Oregon (4), Northern California (3)

U.S. East
N. Virginia (6), Ohio (3)

Canada
Central (3)

Africa
Cape Town (3)

Europe
Frankfurt (3)
Ireland (3)
London (3)
Milan (3)
Paris (3)
Spain (3)
Stockholm (3)
Zurich (3)

Middle East
Bahrain (3)
UAE (3)

South America
São Paulo (3)

Asia Pacific

*Beijing, operated by Sinnet (3)
*Ningxia, operated by NWCD (3)
Hong Kong (3)
Hyderabad (3)
Jakarta (3)
Mumbai (3)
Osaka (3)
Seoul (4)
Singapore (3)
Tokyo (4)

Australia
Sydney (3)
Melbourne (3)

* To comply with China's legal and regulatory requirements, AWS has collaborated with Sinnet and NWCD, the local partners in China for delivering cloud services within AWS China (Beijing) Region and AWS China (Ningxia) Region respectively.

aws

emnify

AWS Direct Connect

OVER 120 AWS DIRECT CONNECT LOCATIONS WORLDWIDE

United States

Ashburn (x2)	Kansas City	Phoenix
Atlanta	Las Vegas (x2)	Portland (x2)
Boston	Los Angeles (x2)	Reston
Chicago (x2)	Miami	San Jose (x2)
Columbus	Milpitas	Santa Clara
Dallas	Minneapolis	Seattle (x3)
Denver	New York, NY	Secaucus
El Segundo	Newark	
Houston	Philadelphia	

Canada

Montréal (x2)
Toronto
Vancouver

South America

Rio de Janeiro
São Paulo (x2)
Buenos Aires

Europe and Africa

Amsterdam (x2)	Marseille
Berlin	Milano (x2)
Cape Town	Munich
Copenhagen	Oslo
Dublin (x3)	Paris (x4)
Frankfurt (x2)	Prague
Hamburg	Slough (x2)
Helsinki	Stockholm (x2)
Johannesburg	Vienna
London (x3)	Warsaw
Madrid (x2)	Zurich (x2)
Manchester	

Middle East

Dubai UAE
Fujairah
Israel Haifa
Manama (x2)
Muscat

China

Shanghai
Shenzhen
Ningxia (x2)
Beijing (x2)

Asia Pacific

Auckland	Melbourne (x2)
Bangalore	Mumbai (x3)
Bangkok	Osaka
Canberra	Perth
Chennai	Seoul (x2)
Delhi	Singapore (x2)
Hong Kong (x2)	Sydney (x3)
Hyderabad	Taipei (x2)
Kuala Lumpur	Tokyo (x2)
Kolkata	
Jakarta (x2)	

*New locations opened in 2023
See AWS Direct Connect locations for more details

aws

emnify

AWS Direct Connect Gateway & Transit Gateway

AWS SERVICES FOR ADVANCED NETWORKING REQUIREMENTS

AWS Direct Connect Gateway

Establish connectivity that spans Virtual Private Clouds (VPCs) spread across multiple AWS Regions
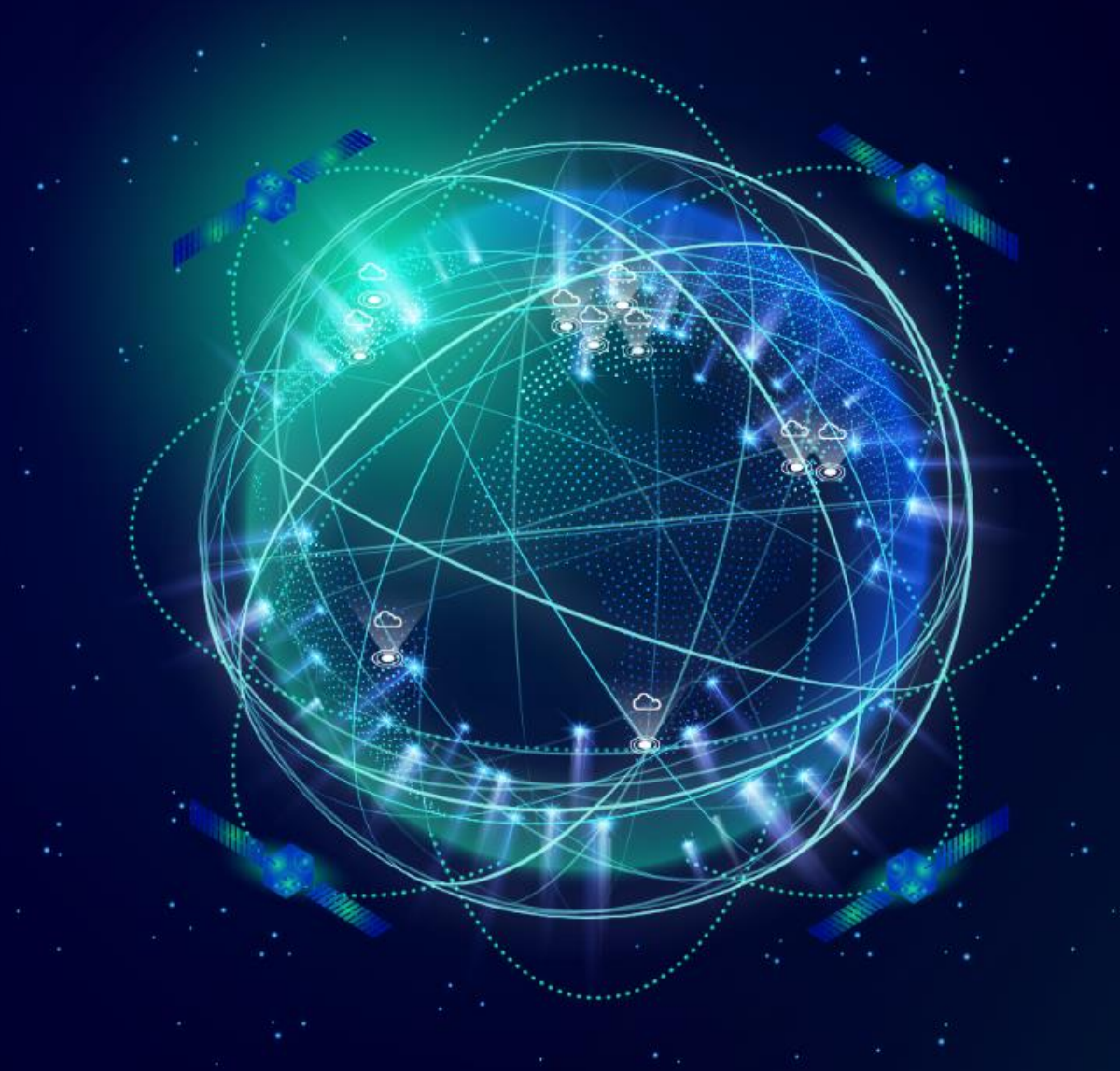
AWS Transit Gateway

Connect VPCs and on-premises networks through a highly scalable cloud router

Introducing the emnify IoT SuperNetwork

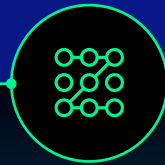Leading a new era of cloud-native IoT connectivity

Today's IoT connectivity challenges

Fragmented coverage, provider & technology landscape

Different regulations & capabilities by regions and network provider

Managing devices, data and SIMs at scale

Multiple integrations needed across the tech stack for connectivity data flow
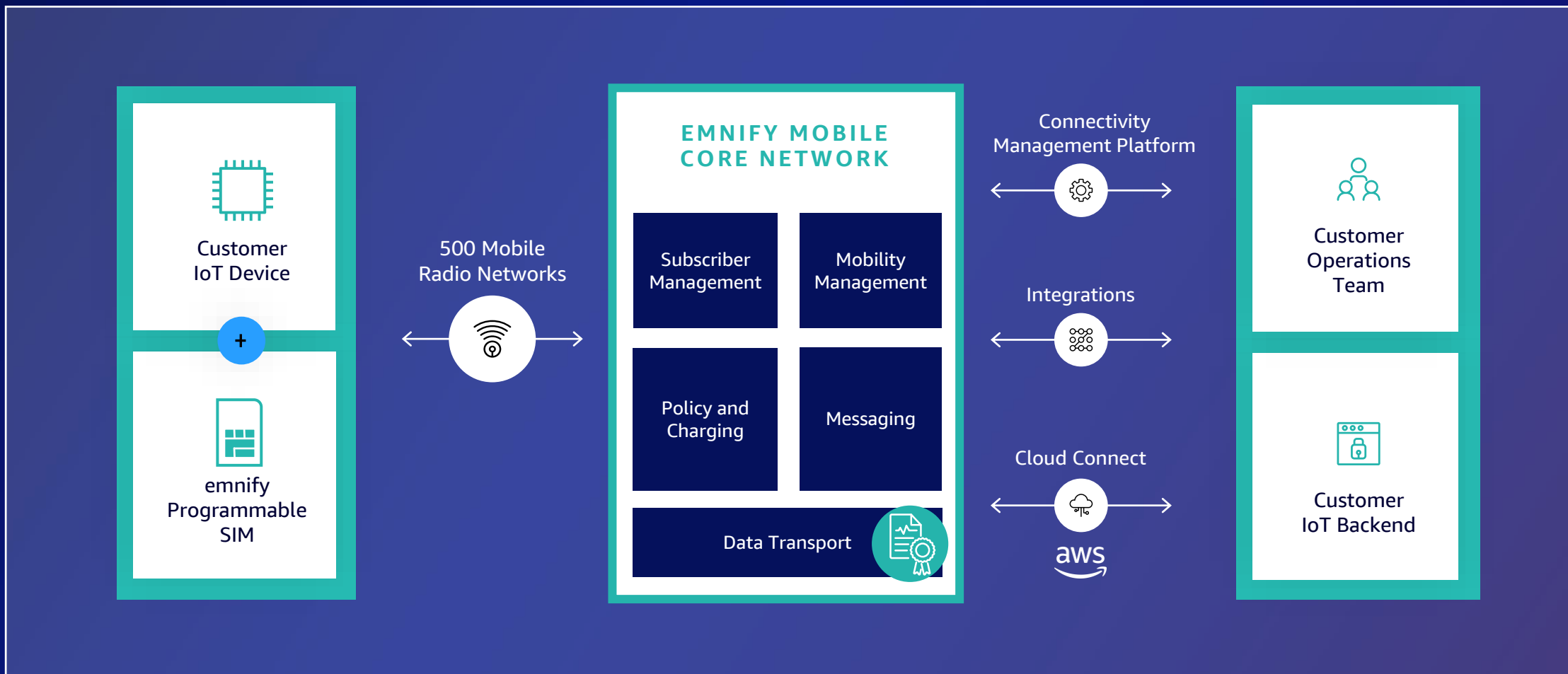
Increasing needs for IoT security & data theft
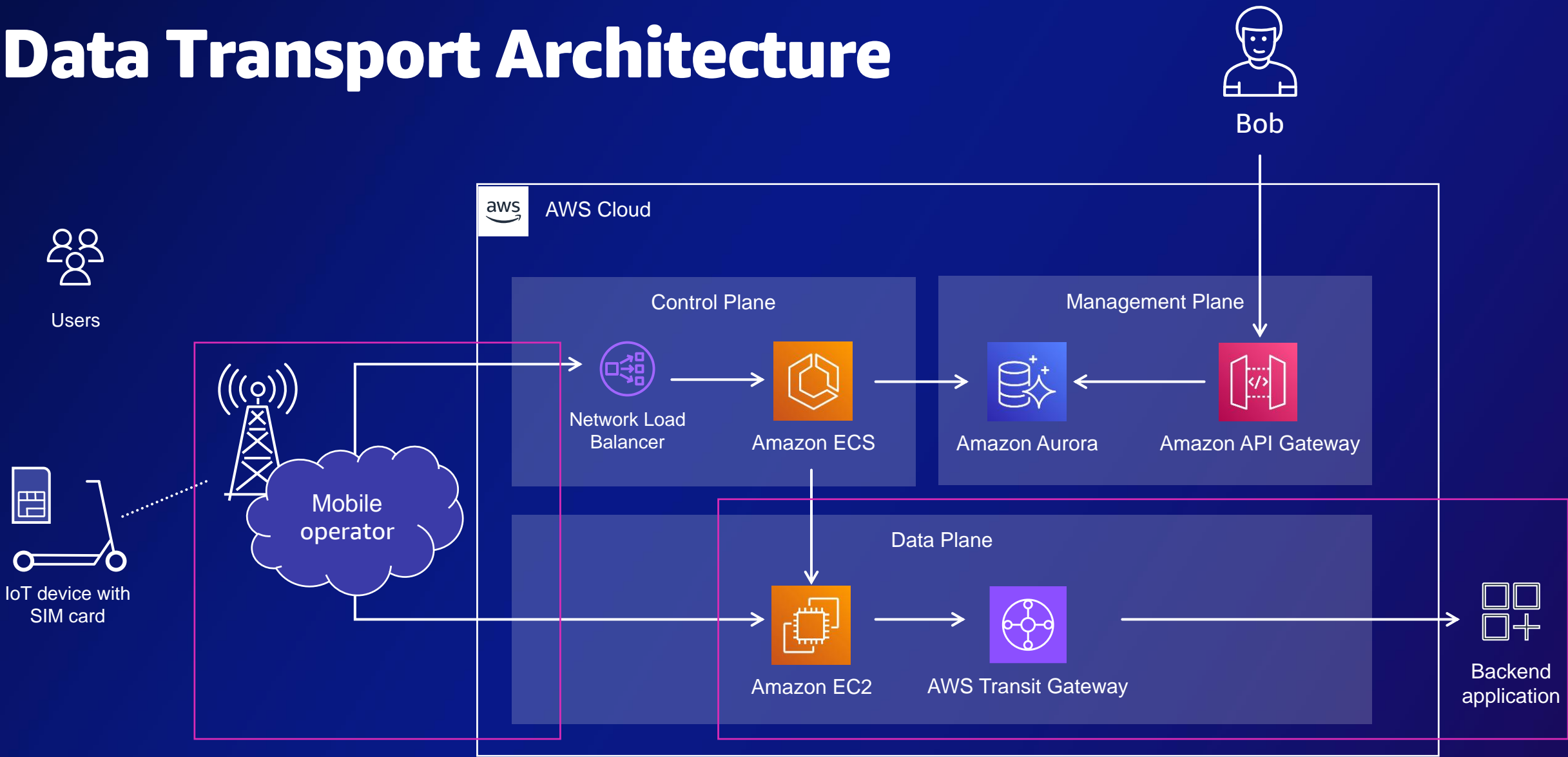
emnify

One SIM,
One Platform,
One IoT
SuperNetwork

IoT Connectivity with just **ONE SIM CARD**

emnify Platform Overview

Customer IoT Device

+

emnify Programmable SIM

500 Mobile Radio Networks

EMNIFY MOBILE CORE NETWORK

Subscriber Management

Mobility Management

Policy and Charging

Messaging

Data Transport

Connectivity Management Platform

Integrations

Cloud Connect

Customer Operations Team

Customer IoT Backend

Data Transport Architecture

Bob

Users

AWS Cloud

Control Plane

Network Load Balancer

Amazon ECS

Management Plane

Amazon Aurora

Amazon API Gateway

IoT device with SIM card

Mobile operator

Data Plane

Amazon EC2

AWS Transit Gateway

Backend application

emnify

Connect to Mobile Operators using AWS Direct Connect

Global IoT deployments

80% of deployments in multiple countries

Require distributed mobile network

emnify's IoT SuperNetwork on AWS

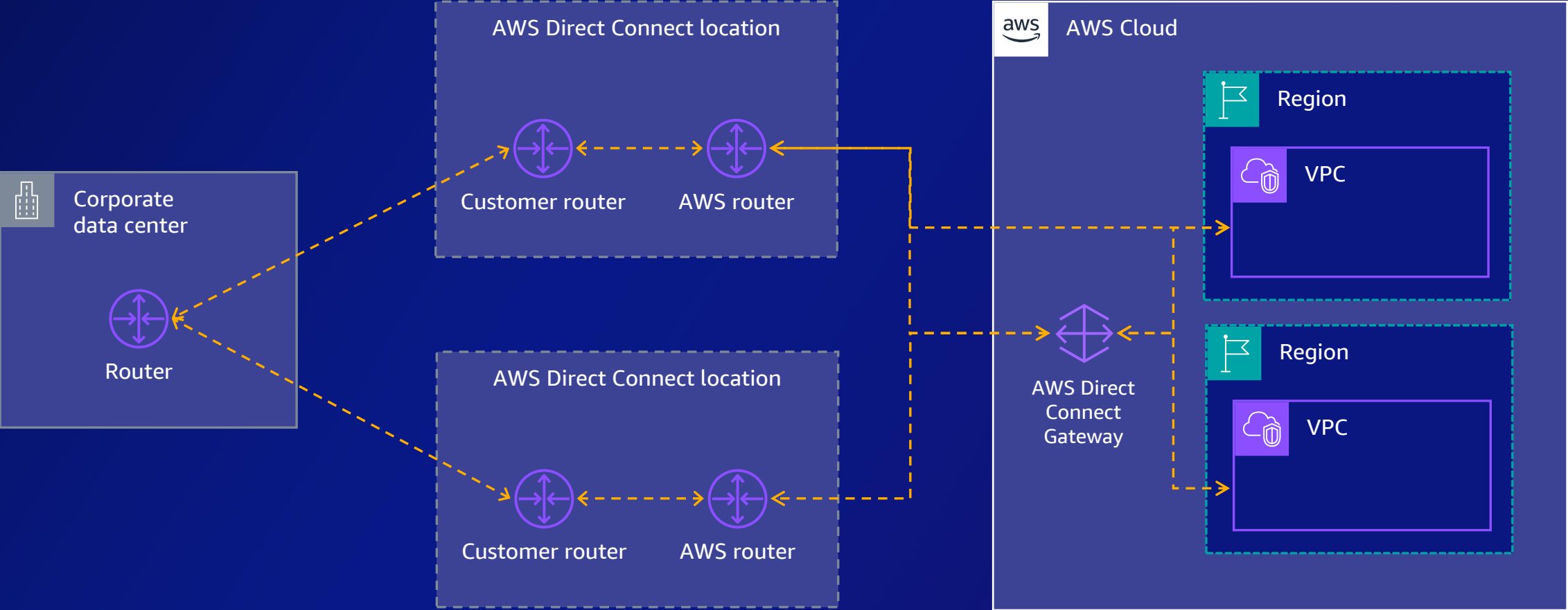## 5 LAUNCHED BREAKOUT REGIONS, MANY MORE IN PREPARATION

United States
N. Virginia

Canada
Central

Europe
Ireland

Asia Pacific
Singapore

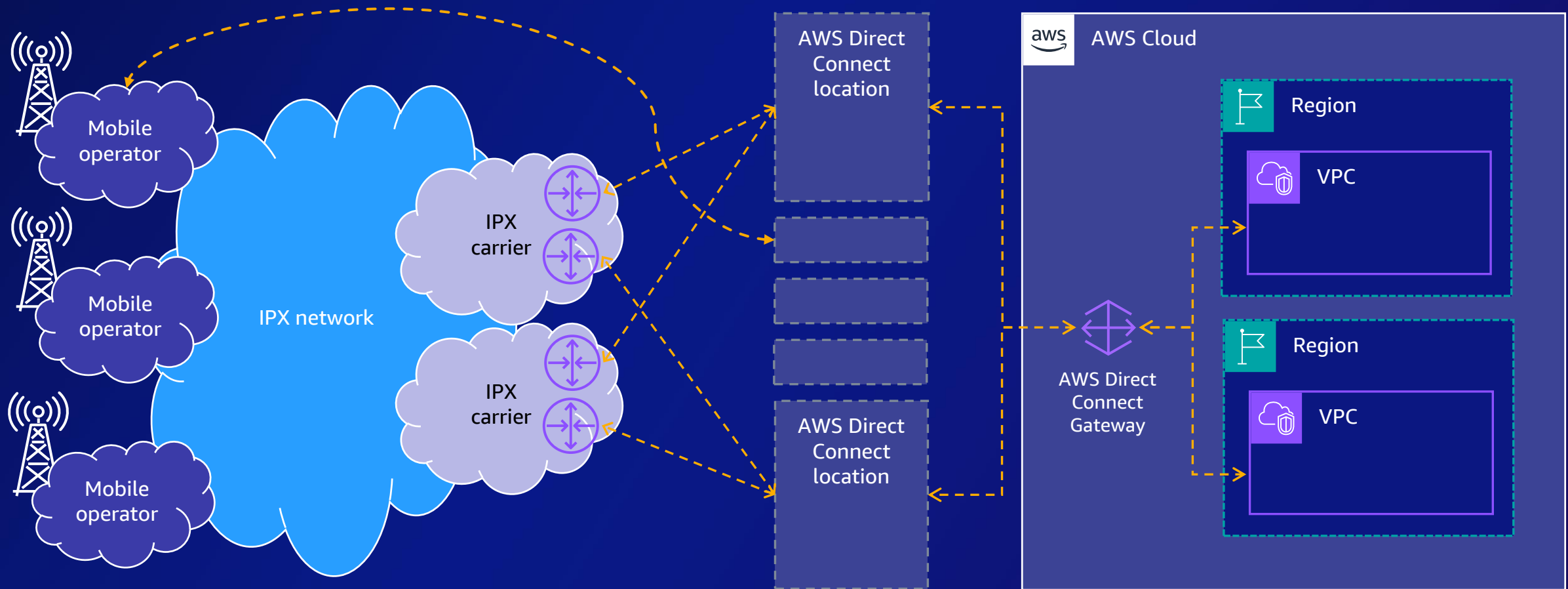**South America**
São Paulo

aws

emnify

Typical Direct Connect Architecture

HOW MOST AWS CUSTOMERS USE DIRECT CONNECT

Interconnecting with 500 Mobile Operators

HOW EMNIFY USES DIRECT CONNECT

Advantages of using AWS Direct Connect

High Quality of Service

Ease of Creating New Peerings

Low Maintenance Effort

Connect to Customers using AWS Transit Gateway

Security to the Network

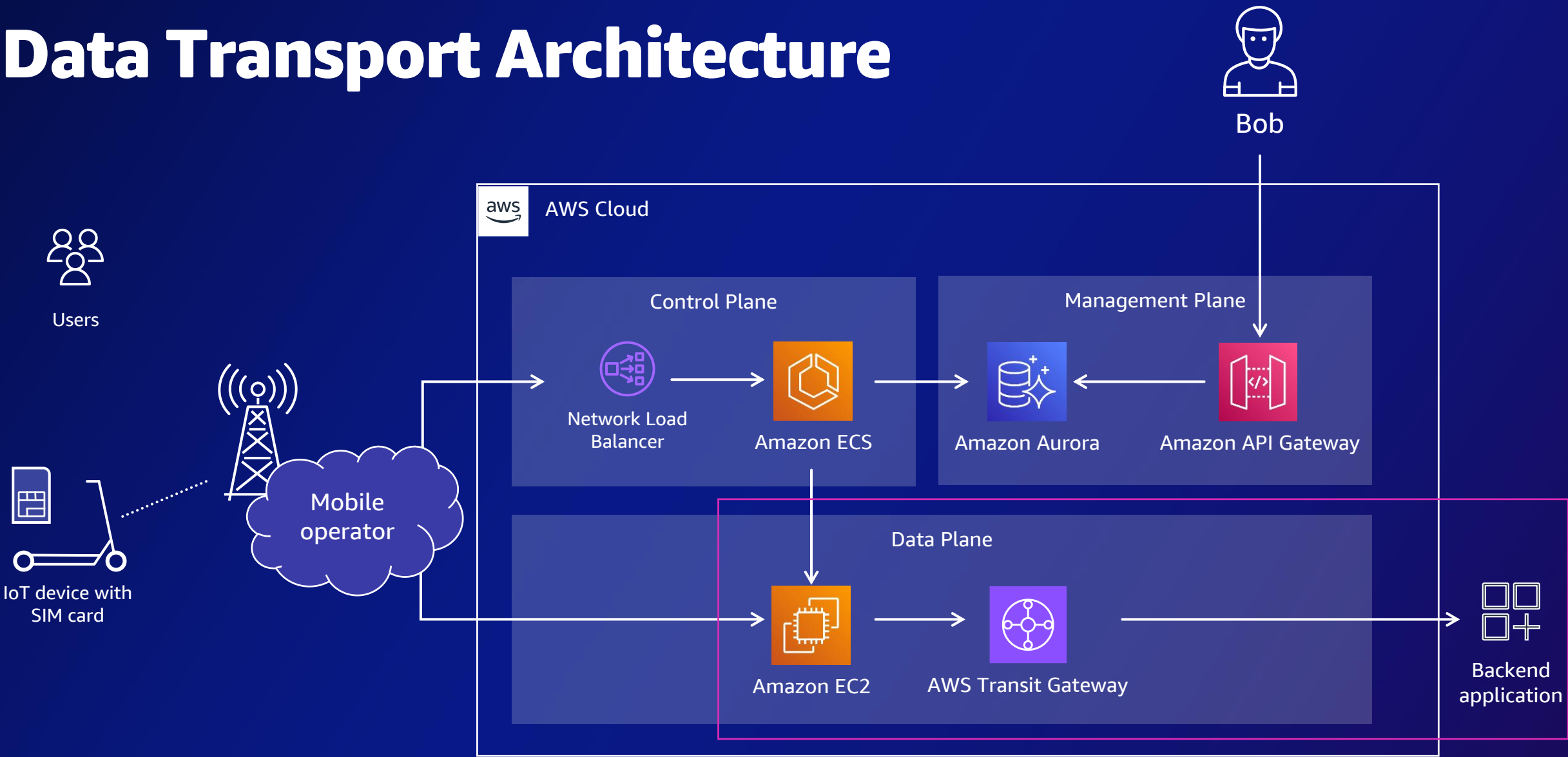CLOUD NATIVE STYLE

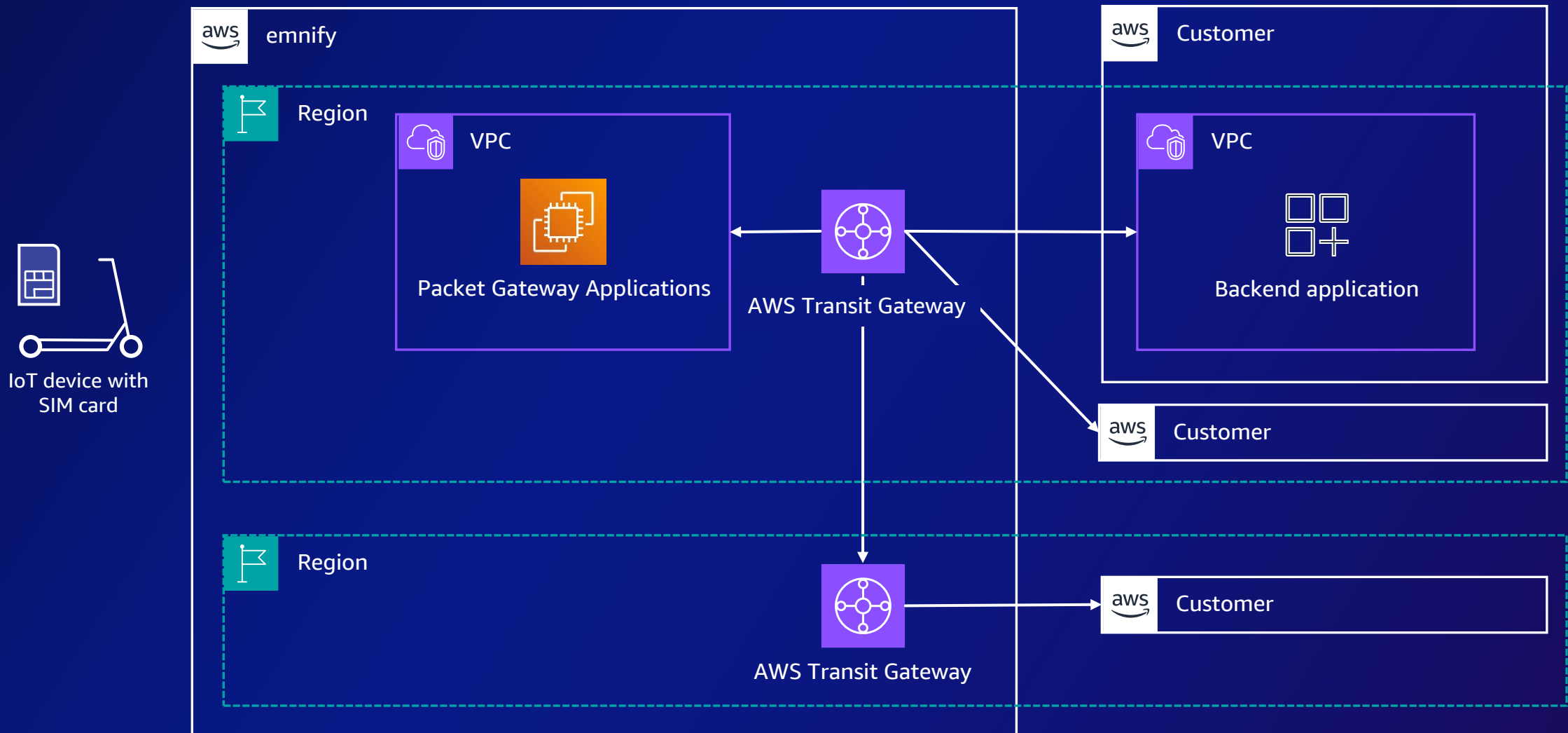Restrict Internet Access

Protect Weak Devices and Protocols

Private Connectivity Required

Data Transport Architecture

Connecting Customer VPCs to emnify

Key Takeaways

Key Takeaways

Global IoT Connectivity over Cellular Networks is hard!

Is your IoT device ready for this?

Key Takeaways

aws is how ⊟Ⅲ emnify

lowers cost.

scales globally.

focuses on business differentiators.

quickly adapts to customer demands.

provides secure and compliant solutions.

Thank you!

Please complete the session survey in the mobile app

Daniel Lemke

Steffen Gebert