



arm

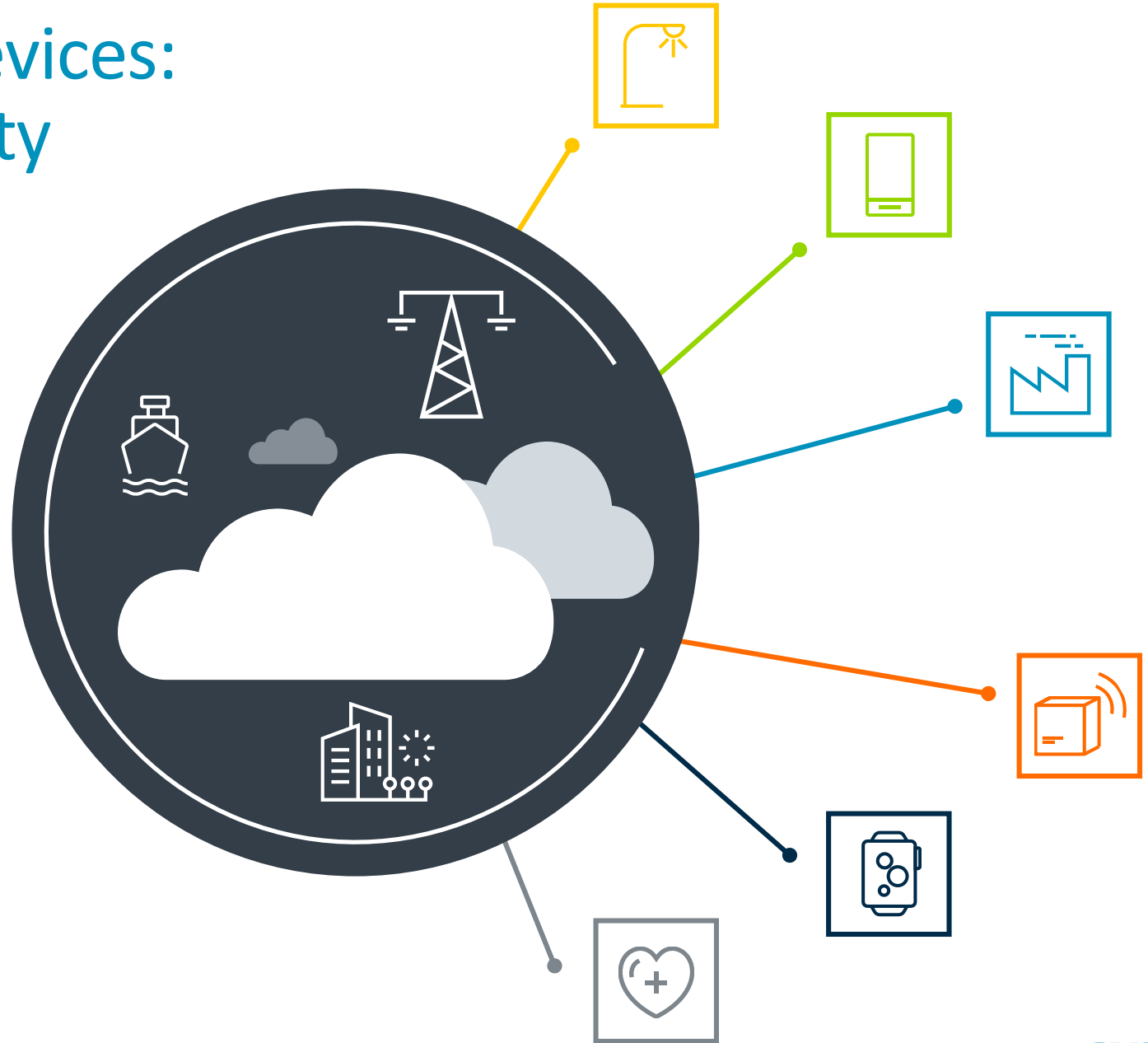
# Collaboration for a Connected World

Arm Tech Symposia  
Syed Natashrul EBG/PCM  
October 2019

# Connecting 1 Trillion Devices: from Challenge to Reality

Key barriers today:

- Seamless deployment of devices globally is difficult and expensive
- Form factors lead to impossibility of devices being connected
- Connectivity is still deemed too costly to be ubiquitous

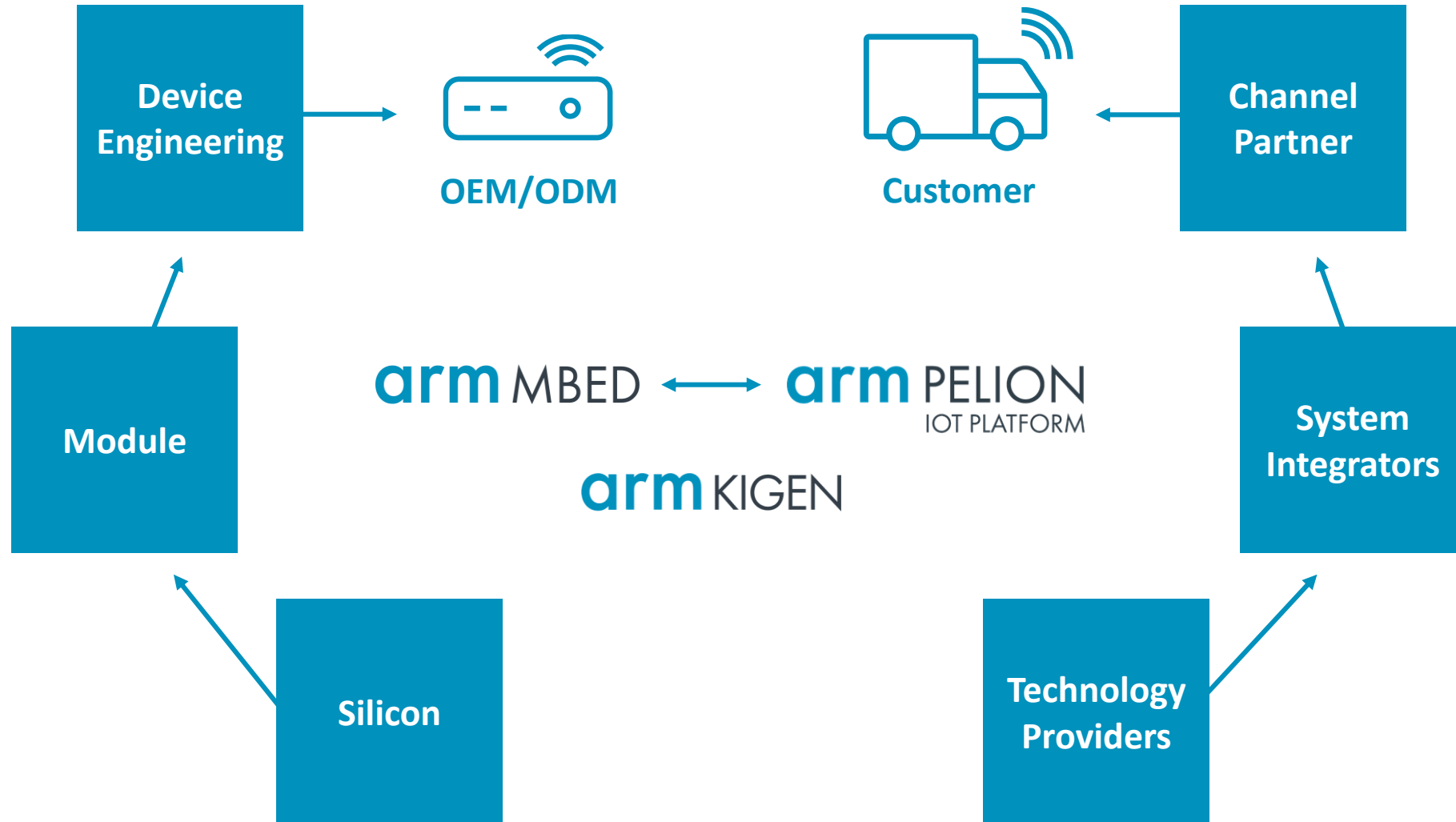


# What is the IoT Device Ecosystem?

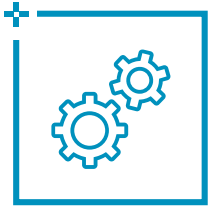
- An IoT device is a system or subsystem which senses, computes and communicates (usually wirelessly) and provides data that can be analysed and acted upon.



# How the Ecosystem Works

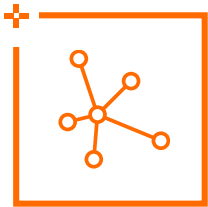


# Ecosystem Challenges

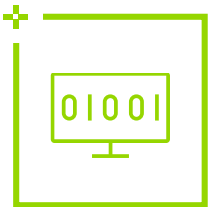


How do I keep my development costs low?

How do I achieve feature velocity in hardware after it's deployed?



How do I connect and manage my device?



How do I make sense of the data coming from my device?

How can I continue to realize value from a device that changes ownership?

How do I get a bigger share of the overall IoT revenue pie?

# Hardware Manufacturers : OEMs/ODMs

## Why they want to be involved in IoT

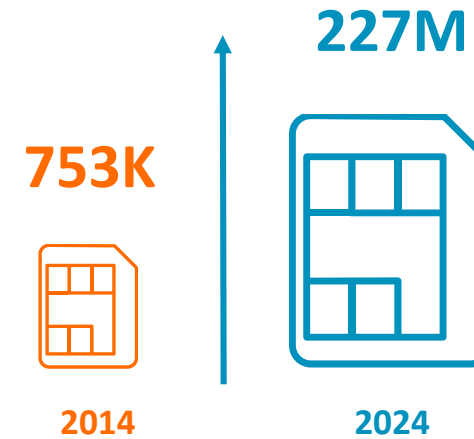


## Challenges in building devices

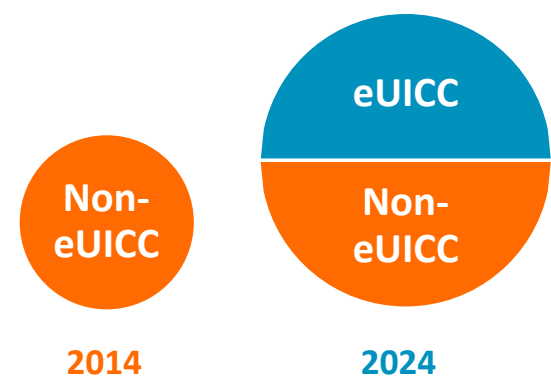
- The ecosystem know how to build hardware and embedded software for **unconnected** products
  - Building and deploying connected products with service roll out to support and monetize is simply not in their DNA
- Desired situation(s)
  - Devices are built in such a way that they automatically connect and transmit usable data
  - Service revenue is like an annuity – devices roll out once and revenue rolls in recurrently

# Module and Semiconductor Manufacturers

- Module vendors and SiPs see eUICC requirements in their area of the value chain
- They are looking for a path towards iUICC (ARM Cryptosland + ARM Kigen eUICC OS)
- Connectivity is a natural fit and path for devices deployed using their hardware
- Arm Pelion helps them gain revenue and advantage through access to global connectivity services for their customers



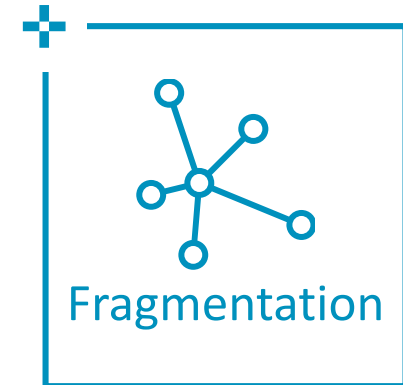
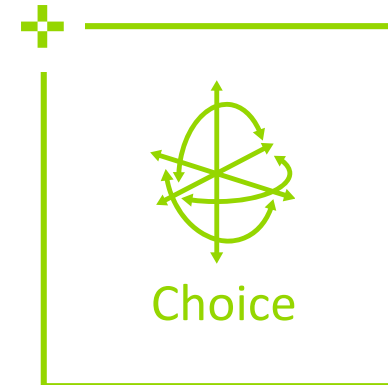
**77% CAGR** for eUICC annual IoT SIM additions



**50% of all IoT SIMs** will support eUICC

# Connectivity Complexity is a Barrier to Scale

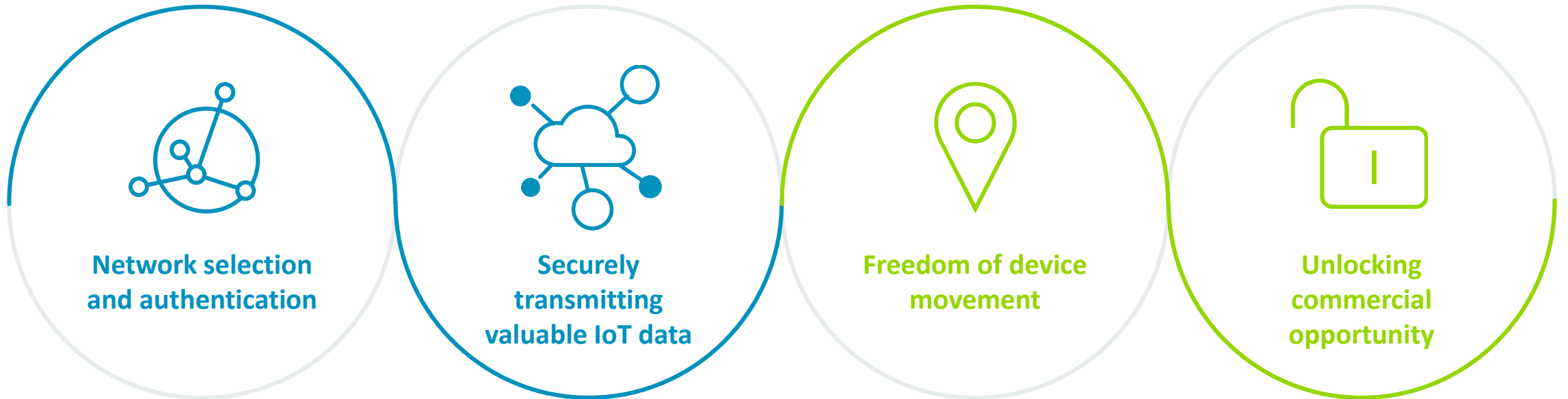
- Choice of connectivity protocols
- Fragmentation of connectivity service providers globally
- Ensuring security in device provisioning and data transit
- Efficient management of deployments





# Connectivity Should be Ubiquitous

One trillion devices need to just connect seamlessly



Foundations for connectivity set before devices leave the production line

# OEM Example : Automotive Journey



## 1 Vehicle completes manufacturing

- Global bootstrap connectivity tested
- eUICC assigned to vehicle

## 2 Vehicle shipped to region

- Global bootstrap connectivity ready
- eUICC assigned to dealer



## 4 Customer uses vehicle locally

- Local eSIM Profile used
- Data routed securely
- Vehicle manufacturer can monitor

## 3 Vehicle sold to customer

- Local eSIM profile applied
- Warranty and infotainment active



## 5 Vehicle used internationally

- New country detected
- Change of eSIM Profile required
- Protection of connectivity regulations
- Protection of costs

## 6 Vehicle Resold or End of Life

- eSIM Profiles removed
- Global bootstrap connectivity reinstated
- Billing and additional services cease



# Build Once & Deploy Anywhere for Connected Devices

Key is a **zero-touch provisioning** process offered with the right level of openness

01

Personalization of chip or SIM with Arm GCB, ARM Kigen OS, Pelion Account

02

Customer buys SIM or chip, chooses Arm for connectivity options

03

Pelion provides connectivity management options regardless of operator/RSP and with an option of ARM Kigen RSP

04

Device wakes up on GCB, is provisioned with production profile enabling local connectivity services



**True scale for device deployment for customers with**



- Single supply chain
- Simplified logistics & hardware
- Build once / deploy anywhere
- Flexible post-deployment management

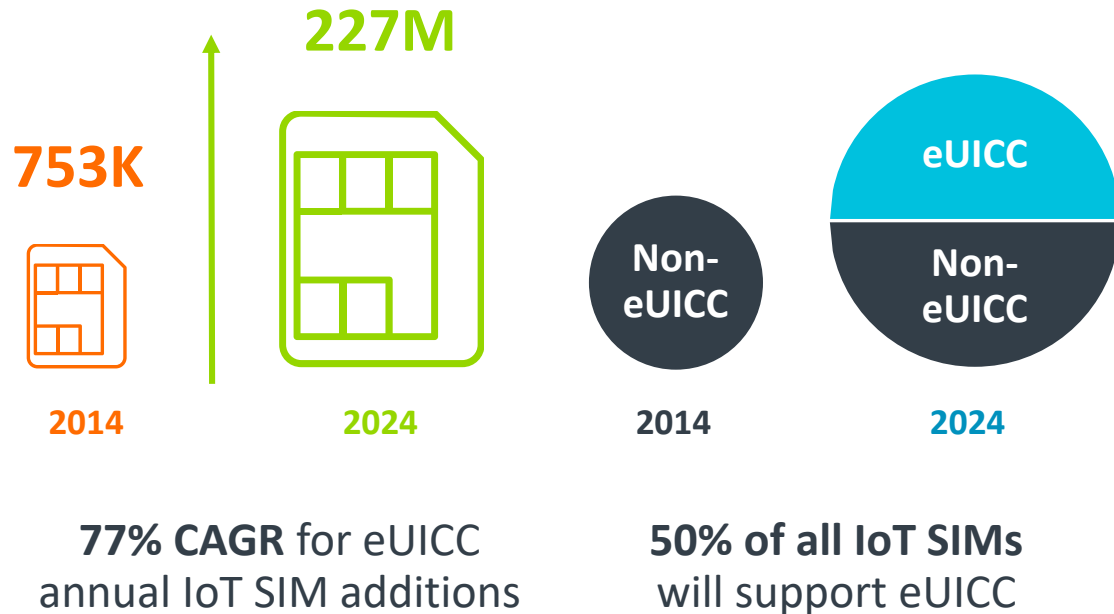


**Infrastructure & technologies that will disrupt & enable IoT at scale**

- iUICC
- AI
- ML
- 5G

# eUICC/eSIM Adoption is Expected to Grow Rapidly

- Strong global demand expected for eUICC IoT SIMs by 2024
- ARM Kigen eUICC OS - Ready



- Segments that will lead eUICC IoT SIMs growth (Gross SIM additions in 2024)
- ARM Kigen RSP - Ready

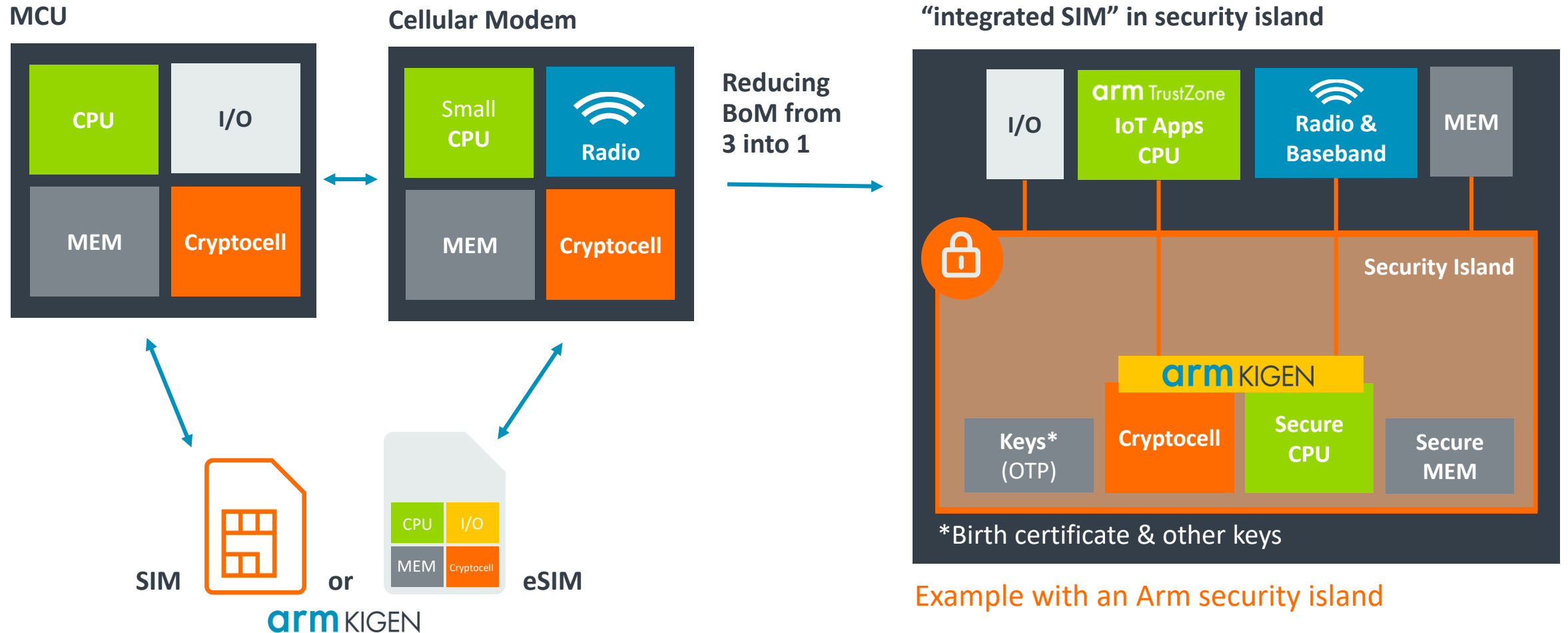


Source: All data from Machina Research

# The Disappearance of the SIM - Integrated SIM

Combining a secure element, cellular modem and MCU...

...into a single SoC



# 2020: Another Step Forward to Zero-touch Provisioning

Enabling infrastructure for large-scale connectivity

## Key Initiatives



**Arm  
GCB**

Wakes up anywhere  
Bootstrap enables  
devices/SoC Arm  
to download  
local MNO profile



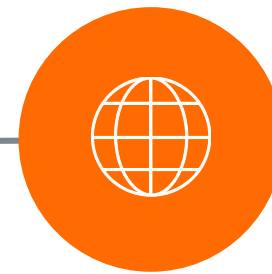
**Remote SIM  
Provisioning**

RSP Partnerships  
Kigen + Pelion:  
• Unique  
interoperability  
• Profile  
orchestration



**MNO  
Engagements**

Agreements:  
• Wholesale  
• Profile download  
Tech integration  
Multi-country  
coverage  
MNO PaaS adoption



**GTM Partner  
Enablement**

Local rates  
Single APN  
Lowering costs

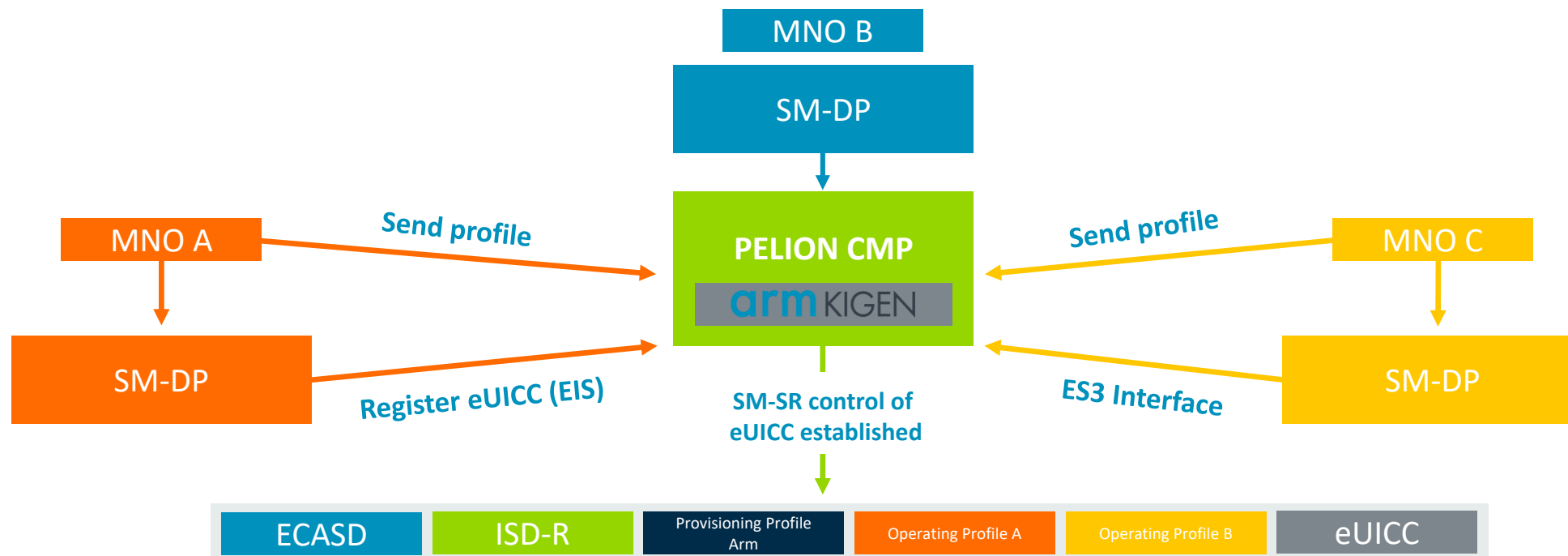


**Single Global e/iSIM**

Build Once  
• Worldwide connectivity  
• HyperScale  
enablement

# Pelion Connectivity Management: How We Simplify

- Driving and building a highly-interoperable connectivity solution.
- Standards-driven global solution.
- Flexible tools such as automation, white labeled platforms.
- Highly experienced in both the device and connectivity space.



# Key Functionality for Operating at Scale: Automation



Automation for  
scale



Real-time data  
triggers

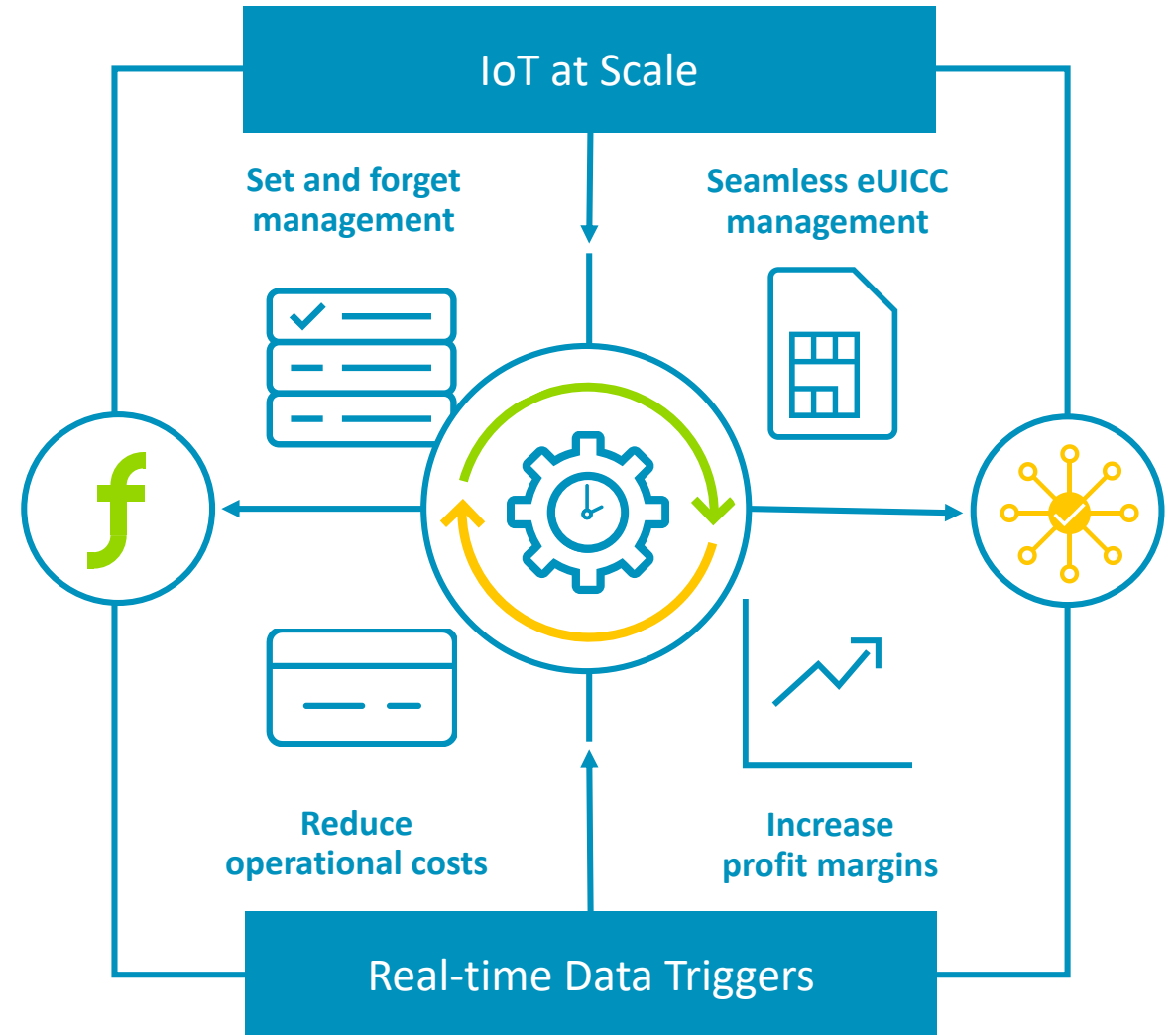


Seamless eUICC  
management



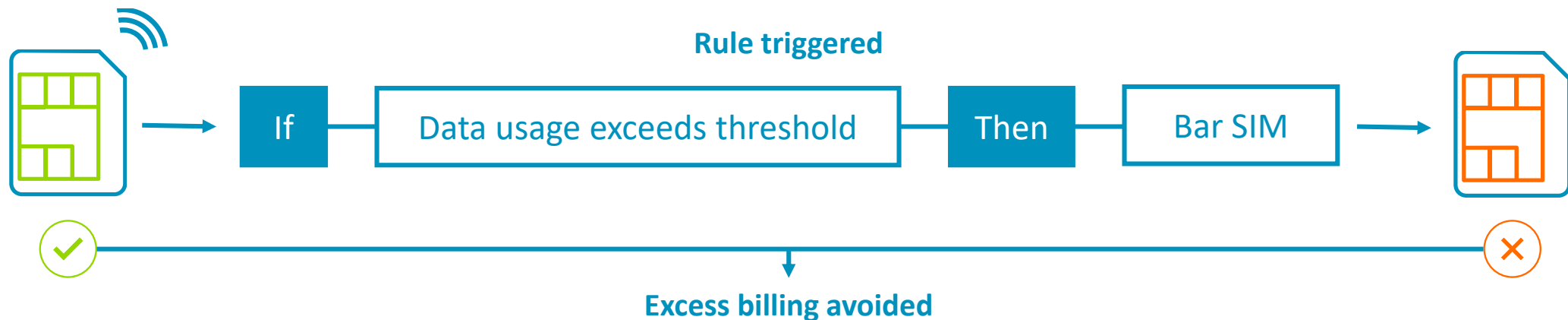
# What Can our Automation Engine Do?

24 hours a day, 7 days a week, 365 days a year - The Automation Engine intelligently manages your entire device deployment



# What Are our Plans for Automation?

- Complex rule processing, enabling and/or rule-based logic
- Integration into various external sources of data, to give more granular control
- Recommended automation rules, based on a subscriber learning approach
- Integration into predictive analytics stack, to remove the reliance on reactive rules but take action before something happens.



# So What do These Capabilities Bring to the Ecosystem?

## Expand to new market

Enable the entire device ecosystem to expand to a new more connected market

## Secure device provisioning

Take advantage of single click access to secure and seamless device provisioning

## Unified view of devices

Keep real-time view of all connections and those of their users



Warehouse



Insights  
& Actions



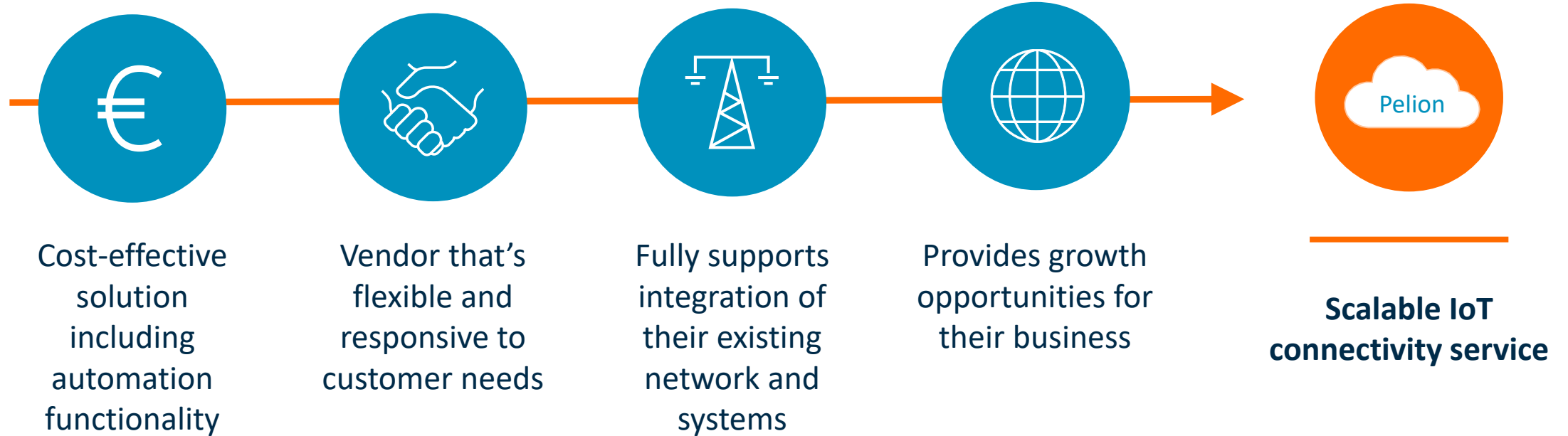
Corporate  
Purchasing



Retail Store

# MNOs Need to Work with the Ecosystem

MNO and the largest communications and entertainment group in Portugal



# Impacts for NOS

- Future-proof solution that is independent of underlying connectivity technology
- Quick time-to-market
- Flexible integration and migration approach
- Access to our global federated network footprint

*Telefonica*

SoftBank



TELE2



T-Mobile



Bringing the world's networks together

# IoT Deployments Simplified.

Automated and simplified connectivity

One global contract

One subscriber for the world

One path to multiple networks

One platform for businesses to serve their users

**Partnership enhances secure device  
provisioning and onboarding**

# Join us in building a better Connected World

Reach out to use directly:

- <https://www.arm.com/products/iot/pelion-iot-platform/connectivity-management/talk-with-an-expert>
- <https://www.arm.com/products/iot/kigen-sim/contact-us>

See for yourself: demonstration of remote SIM provisioning smart meter example

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Thank You  
Danke  
Merci  
谢谢  
ありがとう  
Gracias  
Kiitos  
감사합니다  
धन्यवाद  
شكراً  
ধন্যবাদ  
תודה





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