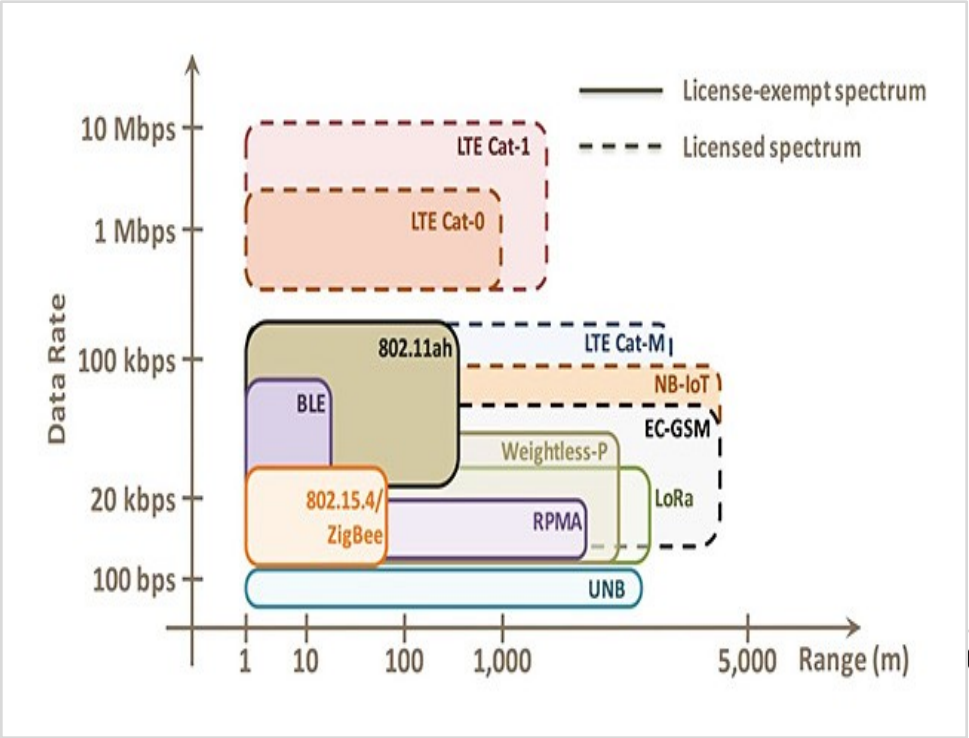


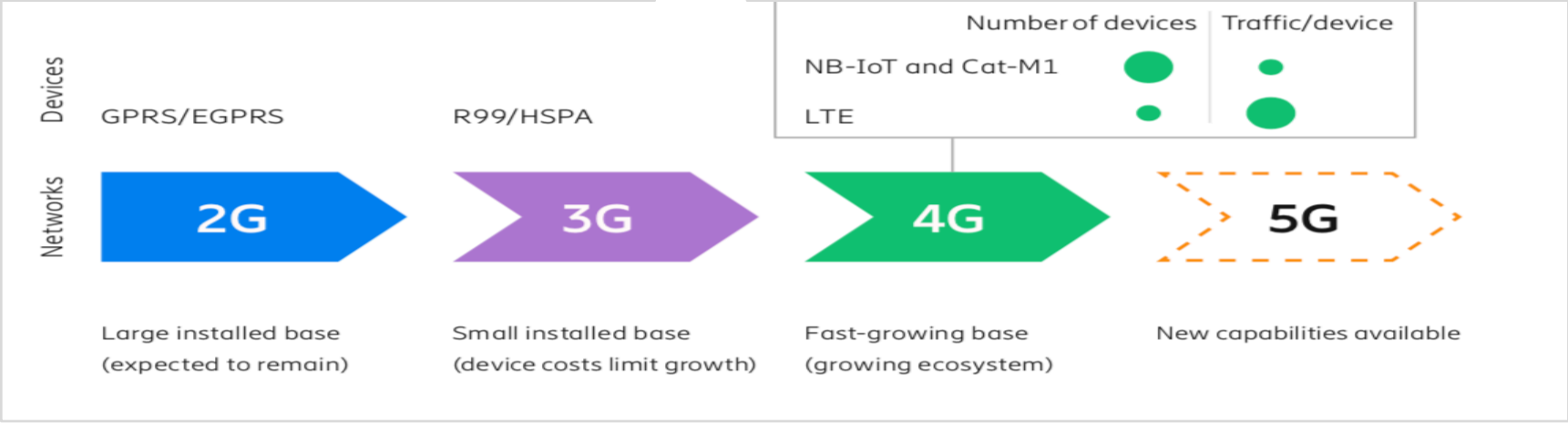
# **MOBILEUM** Roaming IoT Offering



# Mobile IoT Growth



IoT connections (billion)			
<b>IoT</b>	<b>2018</b>	<b>2024</b>	<b>CAGR</b>
Wide-area IoT	1.1	4.5	27%
Cellular IoT <sup>2</sup>	1.0	4.1	27%
Short-range IoT	7.5	17.8	15%
<b>Total</b>	<b>8.6</b>	<b>22.3</b>	<b>17%</b>









# What do IoT Enterprise Need?

## Data requirements for Internet of Things (IoT) applications

● Low    ● Medium    ● High

	Application (select examples)	Data rate	Frequency of data transfer	Data per report	Traffic (MB/ device/month)	Reliability requirements	Security	Level of coverage
 Connected-car applications	Fleet management	●	●	●	●	●	●	Global
	Usage-based insurance	●	●	●	●	●	●	Global
	Stolen-vehicle recovery	●	●	●	●	●	●	Global
	Vehicle platform	●	●	●	●	●	●	Global
	In-vehicle entertainment and access	●	●	●	●	●	●	Global
	Vehicle diagnostics	●	●	●	●	●	●	Global
 Connected- industry and -retail applications	Retail-goods monitoring and payment	●	●	●	●	●	●	National
	Agriculture yield	●	●	●	●	●	●	National
	Public-space advertising	●	●	●	●	●	●	National
	Manufacturing and processing	●	●	●	●	●	●	National
	Logistics routing	●	●	●	●	●	●	Global
	Predictive maintenance, including equipment	●	●	●	●	●	●	Global
	Vending machines	●	●	●	●	●	●	National

McKinsey&Company | Source: 4G Americas; expert and customer interviews; McKinsey analysis



# IoT Roaming Connectivity Services

Cost effective  
Global coverage

Policy Control

Control/Visibility  
to Enterprise

Testing

## SERVICES

Steering

Assure desired  
service levels

Asset Tracking

eSIM Subscription  
Manager

**OUTCOMES**  
**COST REDUCTION**  
**OPERATIONAL**  
**EFFICIENCY**



# Roaming IoT Platform

Take Control of Roaming IoT Devices through Enhanced Visibility coupled with Action

POLICY  
CONTROL

LOCAL  
BREAKOUT

TESTING

Signaling  
Gateway

STEERING

GLOBAL  
CONNECTIVITY

QUALITY

ASSET  
VISIBILITY

COST REDUCTION

OPERATIONS

ROAMING IoT Platform

**Global Connectivity**

*Enable localized profile*

**Specialized Policies**

*Control footprint/services*

**Avoid Data Backhaul**

*Offload data sessions*

**Customer Experience**

*Measure SQI*

**Test Devices**

*Mobile IoT specifics –  
PSM/eDRX*



# Assure Global Connectivity

## Cost Effective Worldwide Connectivity Grid



**RoamSIM**

**Low-cost IoT Roaming**

**Worldwide Coverage**

**Dynamic IMSI Selection**

**Low Cost Wholesale Roaming**

*Dynamically Enabled Localized Profile*

**Global Coverage**

*Via ecosystem of Partner IMSIs*

**Hosted Solution**

*Reduce Setup Cost & Accelerate Launch*

**Turnkey Solution**

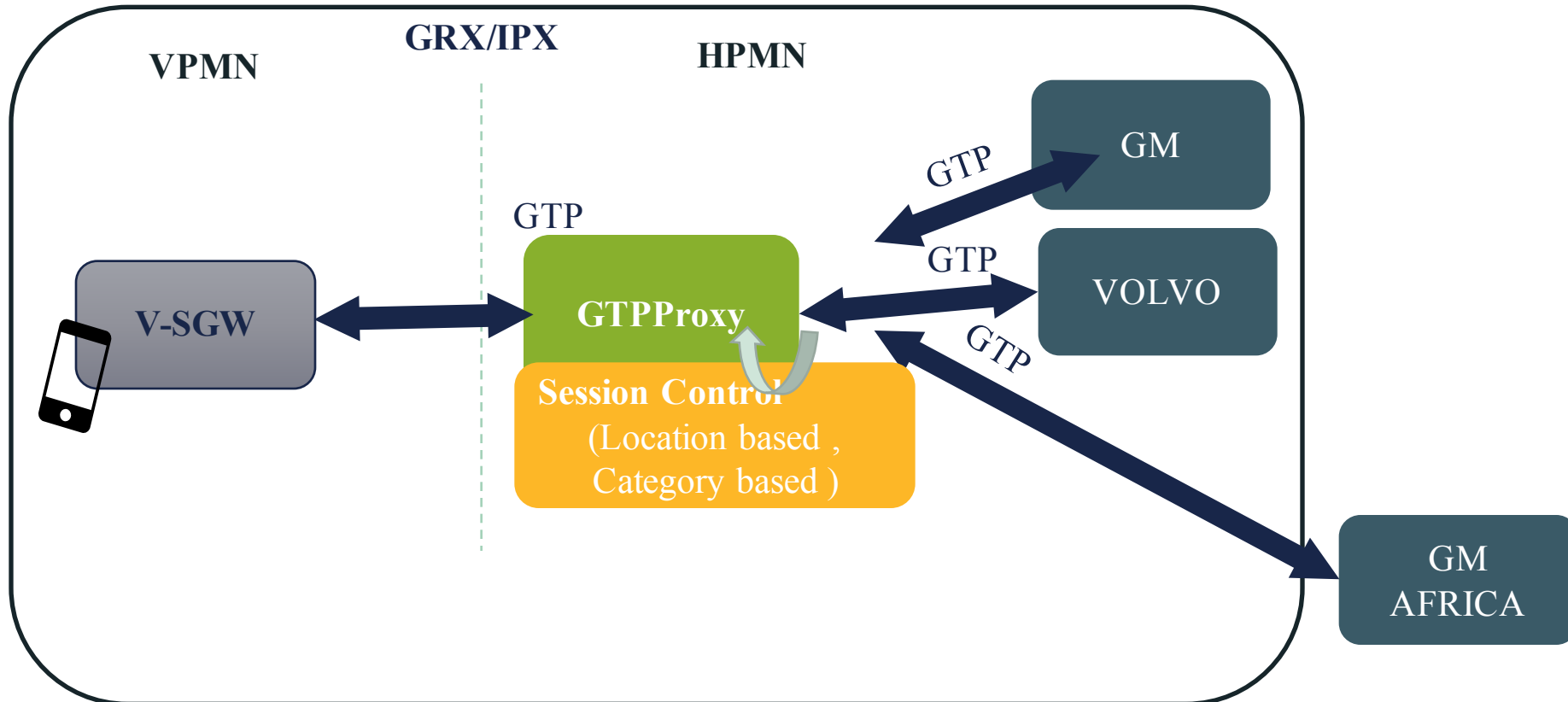
*Bundled Solution with STK, OTA, SIM Cards & TAP Processing*



# Offload Data Sessions to IoT Enterprises

Local breakout to regional IoT Core  
(Longer battery life for IoT devices)

Topology hiding (PGW IPs)





# Evolve Policies for IoT Steering

Footprint  
Control



Bootstrapped  
IMSI



IoT Segment



POLICIES

QoS Assurance



Control/Visibility  
to Enterprise



OTA



SERVICES

Segment	QoS	Partner Network	Roaming Allowed	Service Control	
				Voice	Data
Segment-1	High	Vodafone Germany	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Segment- 2	Normal	Vodafone Netherlands	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Segment-1	N.A	Vodafone Spain	<input type="checkbox"/>	Disabled	Disabled
Segment-2	N.A	Orange Jordan	<input type="checkbox"/>	Disabled	Disabled
Segment-1	High	Orange Spain	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Segment-2	Normal	Orange France	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Segment-2	Normal	T-Mobile US	<input type="checkbox"/>	Disabled	Disabled





# Quality Assurance for IoT Devices

Steer IoT Devices on visited network outage

Quality Insight Engine

NTR  
Zone/CoS -  
SQI

Steer high  
priority  
endpoint  
devices to  
NW B



Network A (P)



Network B (NP)

SQI/CoS –  
Quality Index

T1

T2





# Policy Controls for Roaming IoT Devices

## Real Time and Fine Grained Control



### RoamPolicy

#### Real Time Controls

Prevent Leakage

Monitor Cost

Footprint Control

Enforce Fair Usage Policy (FUP)

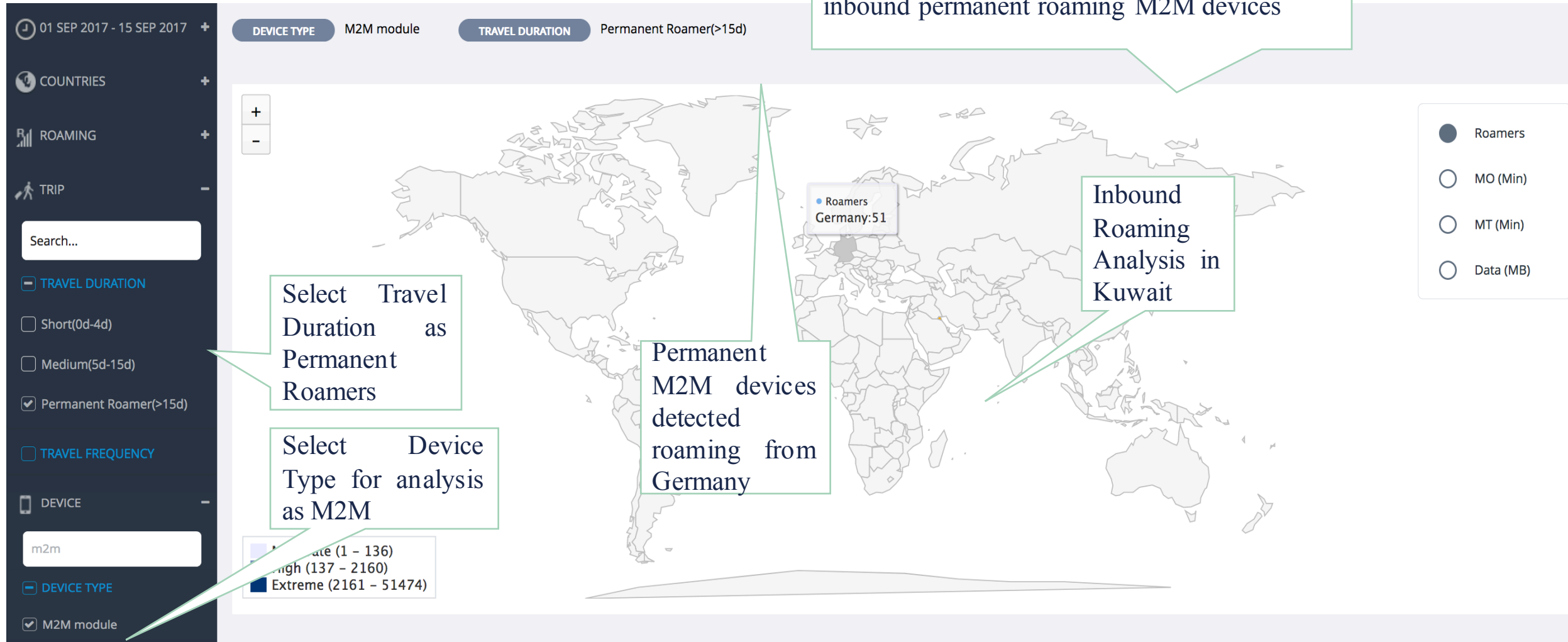
Prevent Access In High Cost Networks

Implement Regulation  
*eCall, PR etc.*



# Fingerprinting Inbound IoT Devices

Global Heat Map provides birds eye view of inbound permanent roaming M2M devices





# Testing for mIoT Roaming Devices

Enable IREG End-to-end Functional Capability Tests

MS can successfully request Power Saving Mode during attach

MT Data in PSM state

MO Data in PSM State

Validate eDRX (Extended Discontinuous Reception) Request and Activation

Exit eDRX Cycle







**MOBILEUM**  
THANK YOU