WAS#12

VoLTE & 5G ROAMING ROUNDTABLE

October 20, 2020 | Virtual Session

ROUNDTABLE OBJECTIVE

Stimulate interaction and **information sharing** with Mobile operators on VoLTE Roaming and 5G Roaming, despite limitations of its virtual nature

A pragmatic and **constructive** discussion, allowing early adopters to find each other and share their experiences and the ecosystem to benefit

ON THE AGENDA

14:00 – 14:05	Welcome & Introduction Session Objective & Agenda	Patrick George, EVP Product & Business Development, iBASIS
14:05 – 14:15	Travel & Roaming Outlook	Jon King, CCO, Kaleido Intelligence
14:15 – 14:25	VoLTE Roaming Taskforce Update	Dhiraj Wazir, CEO, ROCCO Strategy
14:25 – 14:35	Operator's perspective: Verizon	Jason Olivieri, Manager Roaming Marketing, Verizon Customer Group
14:35 – 14:45	Operator's perspective: Reliance Jio	Luc Lamoureux, Director International Roaming and Network Planning, Reliance Jio
14:45 – 14:55	The 5G IPX Perspective	Mehmet Turunc, 5G Product Lead, iBASIS
14:55 – 15:00	Conclusions & Wrap-up	Patrick George

Travel & Roaming Outlook

14:05 – 14:15

Jon King, CCO

Kaleido Intelligence
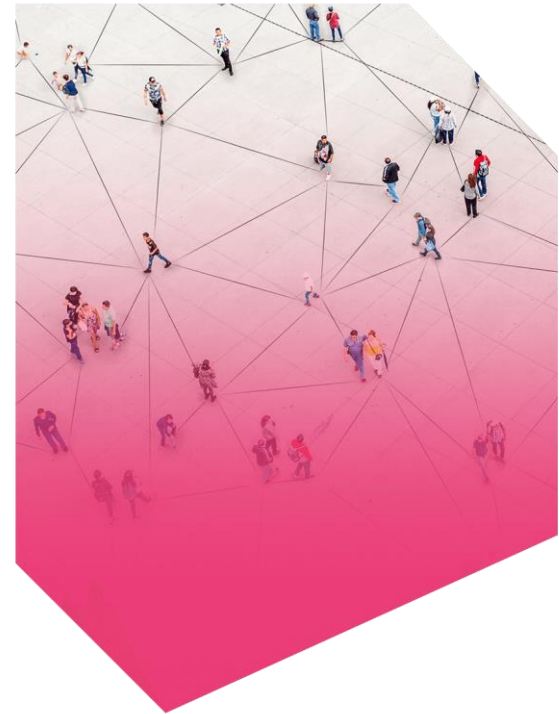
iBASIS

Travel & Roaming Outlook 2020

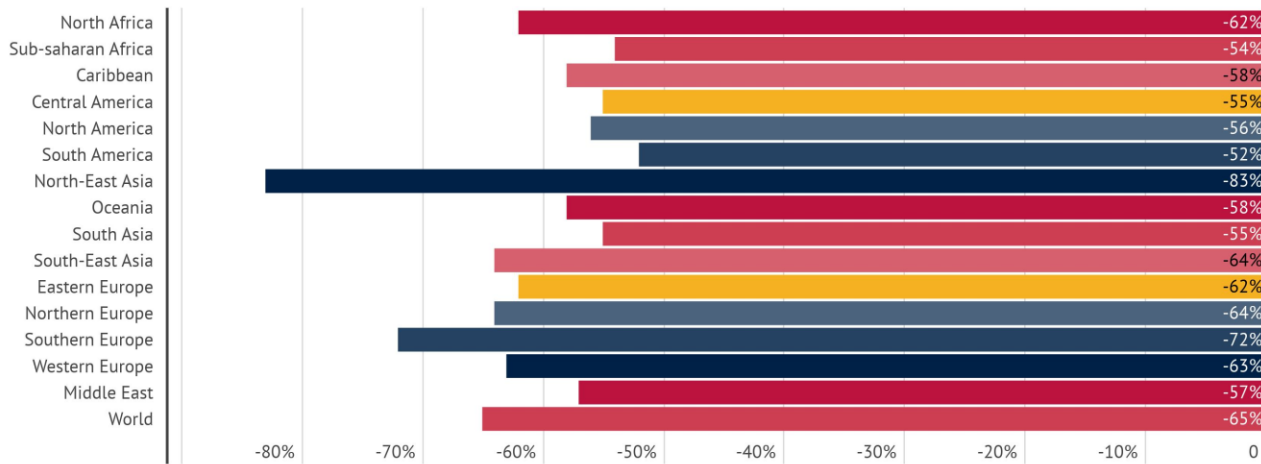## iBASIS VoLTE & 5G Roundtable WAS#12

Presentation by Kaleido Intelligence

roaming.kaleidointelligence.com

COVID-19 IMPACT ON TRAVEL & TOURISM: Q3 2020 UPDATE FROM KALEIDO

Kaleido Intelligence

Fall in International Arrivals Travel Volume, H1 2020 Actuals

Region	Value
North Africa	-62%
Sub-saharan Africa	-54%
Caribbean	-58%
Central America	-55%
North America	-56%
South America	-52%
North-East Asia	-83%
Oceania	-58%
South Asia	-55%
South-East Asia	-64%
Eastern Europe	-62%
Northern Europe	-64%
Southern Europe	-72%
Western Europe	-63%
Middle East	-57%
World	-65%

Axis: -80% -70% -60% -50% -40% -30% -20% -10% 0

Inbound Travel Trips in Millions (Includes Same-Day Leisure, Work & Overnight Trips) 2020 Estimate

Europe	East Asia & Pacific	North America
402 million	100 million	80 million

Kaleido expect a decline in travel of around 64% and 1.3 billion in travel trip volume in 2020.

COVID-19 IMPACT ON DATA ROAMING: FORECAST OUTLOOK FROM KALEIDO

Kaleido Intelligence

Growth in Outbound Roaming Data Traffic in Petabytes, Consumer & Cellular IoT Device Traffic

Year	Consumer Data Roaming Traffic in PB	IoT Data Roaming Traffic in PB
2019	745	111
2020	336	128
2021	646	160
2022	889	236
2023	1,035	334
2024	1,326	442
2025	1,658	564

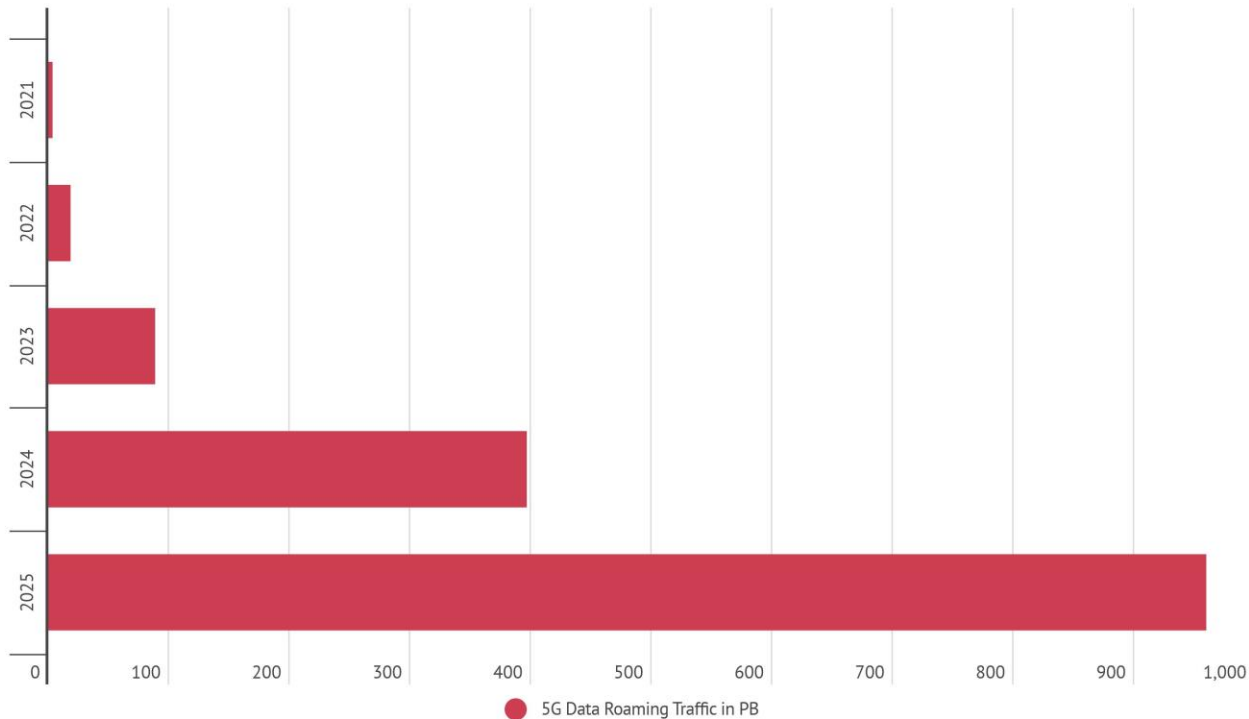● Consumer Data Roaming Traffic in PB ● IoT Data Roaming Traffic in PB
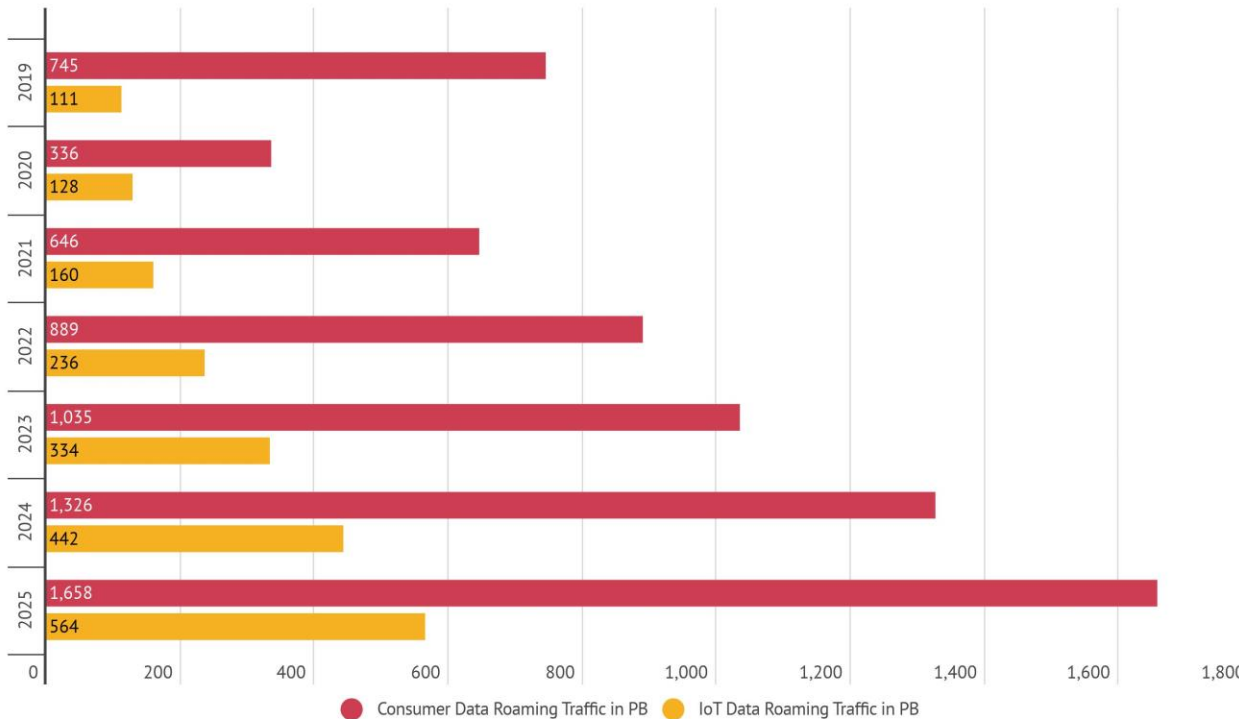
Operators will innovate to launch new cheaper roaming plans, day passes and extend RLAH to newer markets and travel corridors to drive usage as travel recovers.

roaming.kaleidointelligence.com

5G CONSUMER & IoT ROAMING OUTLOOK 2025

Kaleido Intelligence

Growth in Outbound 5G Data Roaming Traffic in Petabytes, Consumer & Cellular IoT Device Traffic

Bar chart showing 5G Data Roaming Traffic in PB by year:
- 2021: ~5
- 2022: ~25
- 2023: ~100
- 2024: ~410
- 2025: ~980

● 5G Data Roaming Traffic in PB

Kaleido forecasts that the number of 5G roamers will reach 310 million in 2025, representing an average annual growth rate of 363% over the next 5 years.

roaming.kaleidointelligence.com

Follow us:

@kaleidointel

roaming.kaleidointelligence.com

Kaleido Intelligence

VoLTE Roaming Taskforce Update

14:15 – 14:25

Dhiraj Wazir, CEO

ROCCO Strategy
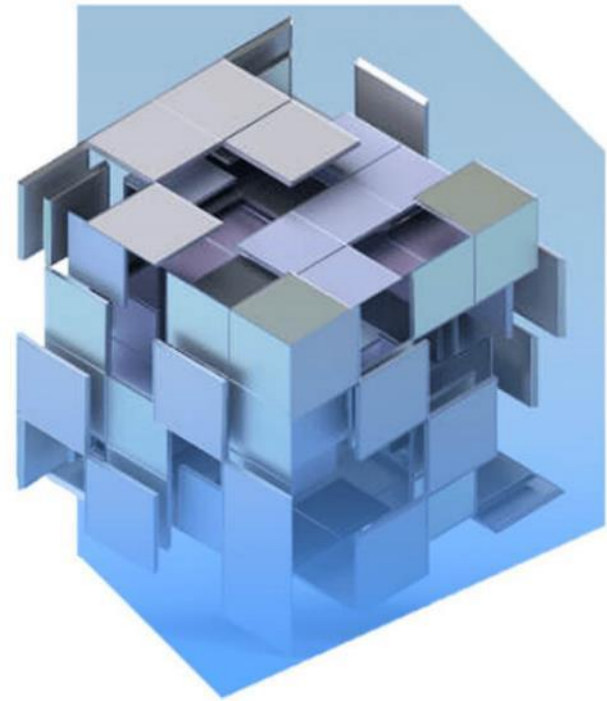
# VoLTE ROAMING TASKFORCE UPDATE

WHO WE ARE?

The VoLTE Roaming Taskforce is an **MNO member only** initiative founded and facilitated by ROCCO with a mission to mobilise the industry, search for and streamline solutions to accelerate implementation of VoLTE Roaming across mobile operators with the clear view to also start charting the path for Voice over 5G.

All MNOs are invited to join this open taskforce.

The Taskforce is chaired by Jason Olivieri from Verizon USA.

oLTE
ROAMING TASKFORCE

MAIN CHALLENGES

VoLTE
ROAMING TASKFORCE
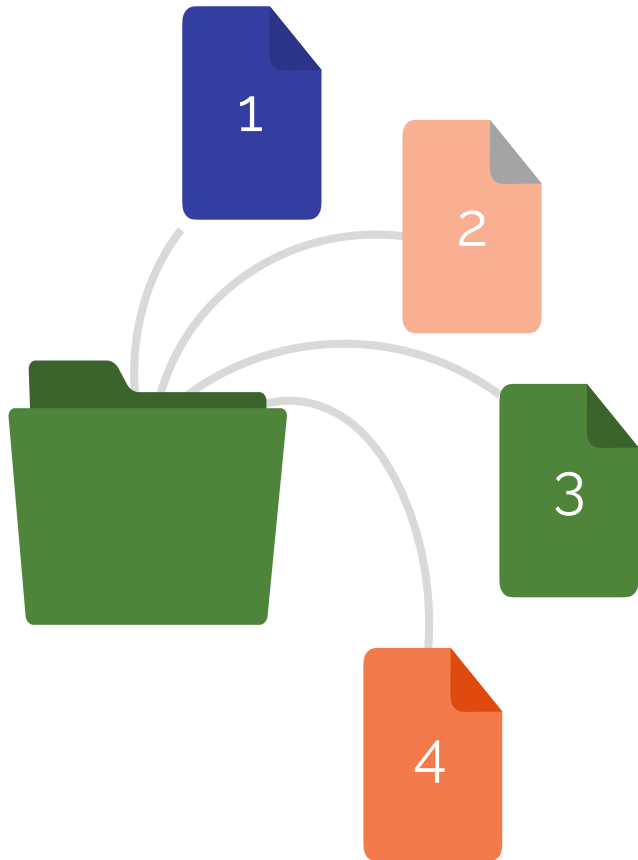
1
- Awareness & link with decommissioning::
- LinkedIn Group, website, blogs.

2
- Handset Vendors & Testing
- Verizon Engagement, Handsets identified,
- Solutions Identified.

3
- Emergency Calling
- Further research and recommendations

4
- Lawful Intercept
- Solution Presented.

![iBASIS logo]

Operator's perspective Verizon

14:25 – 14:35

Jason Olivieri,
Manager Roaming Marketing

Verizon Customer Group

VoLTE & 5G Roaming

Insights

Jason Olivieri

verizon✓

VoLTE

Emergency numbers

Non national – local emergency numbers beyond 112/911 – Regulator expectation!

- VPMN advertises all local emergency numbers during Attach sequence.

- HPMN develops a solutions to list all local emergency numbers where the VPMN does not advertise emergency numbers during attach

- Standardize the the approach to local emergency numbers. (GSMA)

Device

- All OEM's enable all devices with VoLTE on

- Apple communications process.

verizon✓

5G –

Experience

- Testing has been smooth.
    - Testing on n78 networks has yielded speeds of 300Mb DL to 600Mb DL
    - AVP modification required

- Device
    - Frequencies
    - Carrier agnostic software build
    - Planning
    - Apple 5G NR (Bands n1, n2, n3, n5, n7, n8, n12, n20, n25, n28, n38, n40, n41, n66, n71, n77, n78, n79)
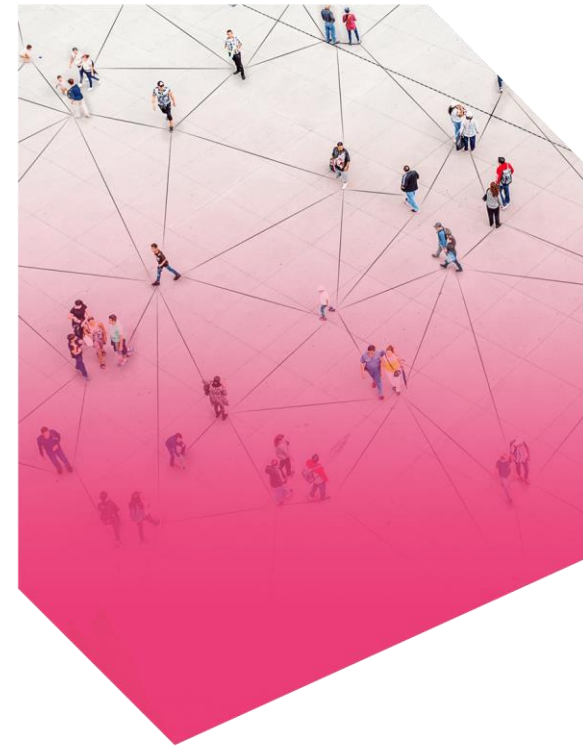
Operator's Perspective Reliance Jio

14:35 – 14:45

Luc Lamoureux,
Director International Roaming
and Network Planning

Reliance Jio

Reliance JIO - India

- JIO is the newest operator in India
  - Roaming launched May 2018
  - Looking for VoLTE partners
  - IMS must be unencrypted for Lawful Intercept

- JIO 5G
  - Intent to launch but cannot discuss since auction in India pushed to 2021
  - NSA has same Diameter signaling as LTE and VoLTE

- JIO has NB-IOT network pan-India
  - Support Guardband for 3, 5 & 40 for roaming in India and also domestic
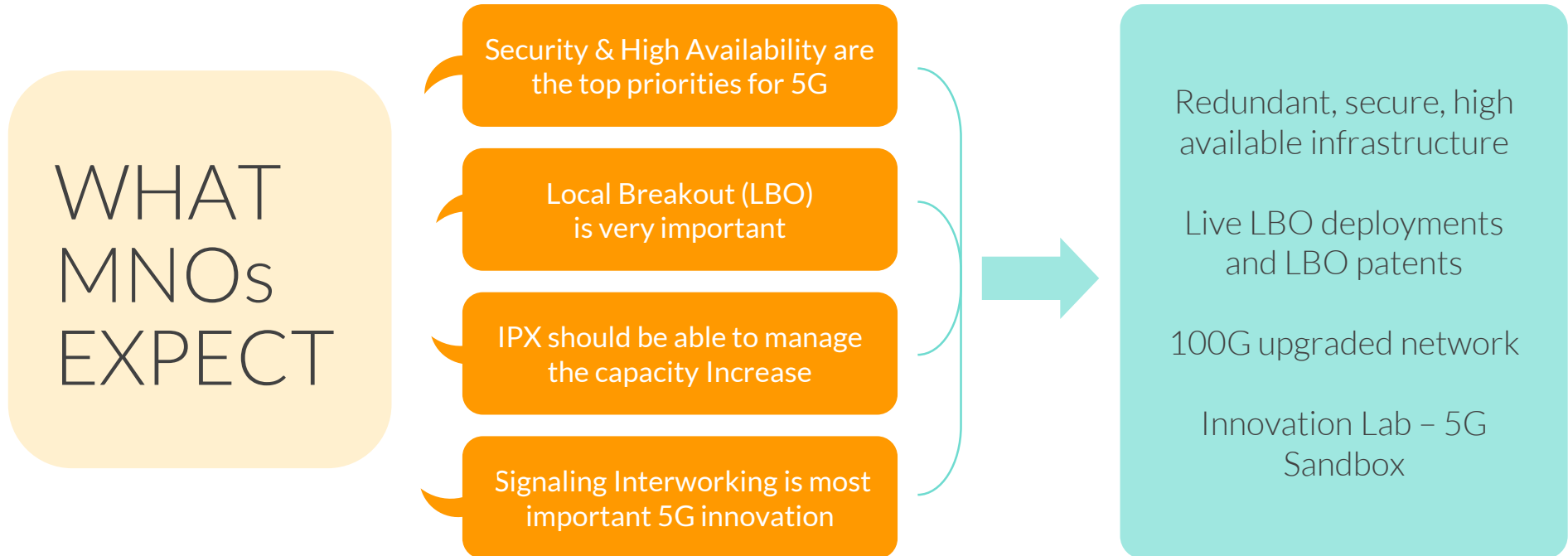
The 5G IPX Perspective

14:45 – 14:55

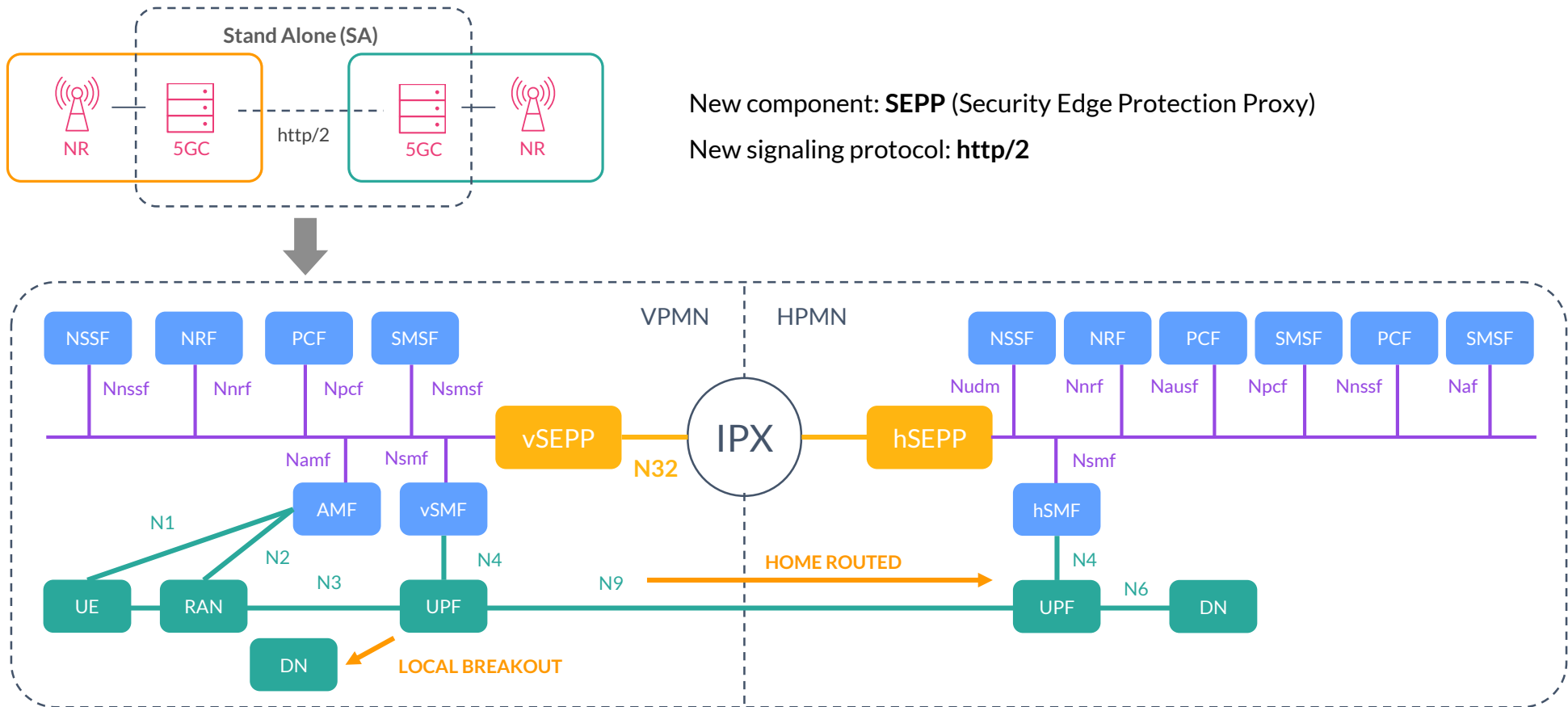Mehmet Turunc, 5G Product Lead

iBASIS

WHAT DO MNOs EXPECT MOST?

IBASIS

WHAT MNOs EXPECT

Security & High Availability are the top priorities for 5G

Local Breakout (LBO) is very important

IPX should be able to manage the capacity Increase

Signaling Interworking is most important 5G innovation

Redundant, secure, high available infrastructure

Live LBO deployments and LBO patents

100G upgraded network
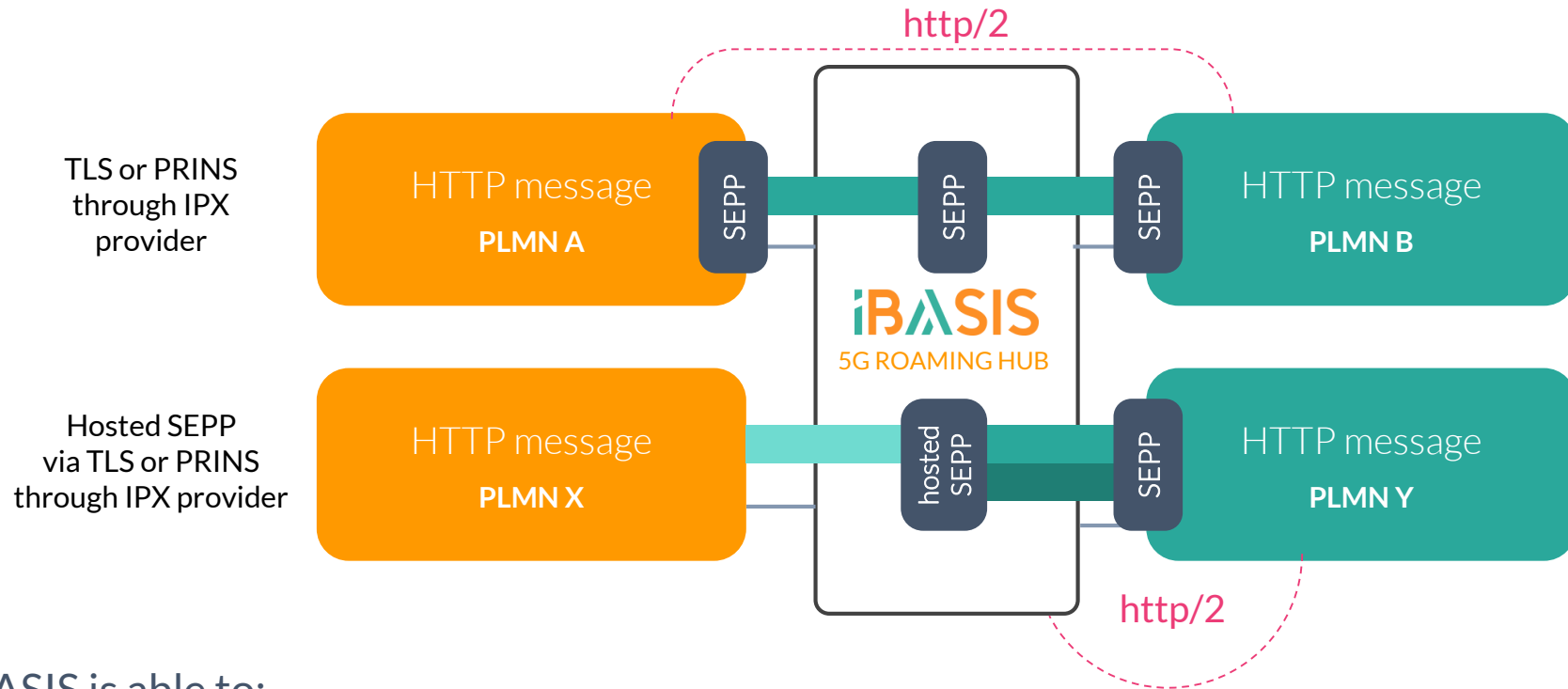
Innovation Lab – 5G Sandbox

Survey data based on 60+ participants

iBASIS preparations

WHAT ARE THE NEW FUNCTIONS IN 5G?

New component: **SEPP** (Security Edge Protection Proxy)

New signaling protocol: **http/2**

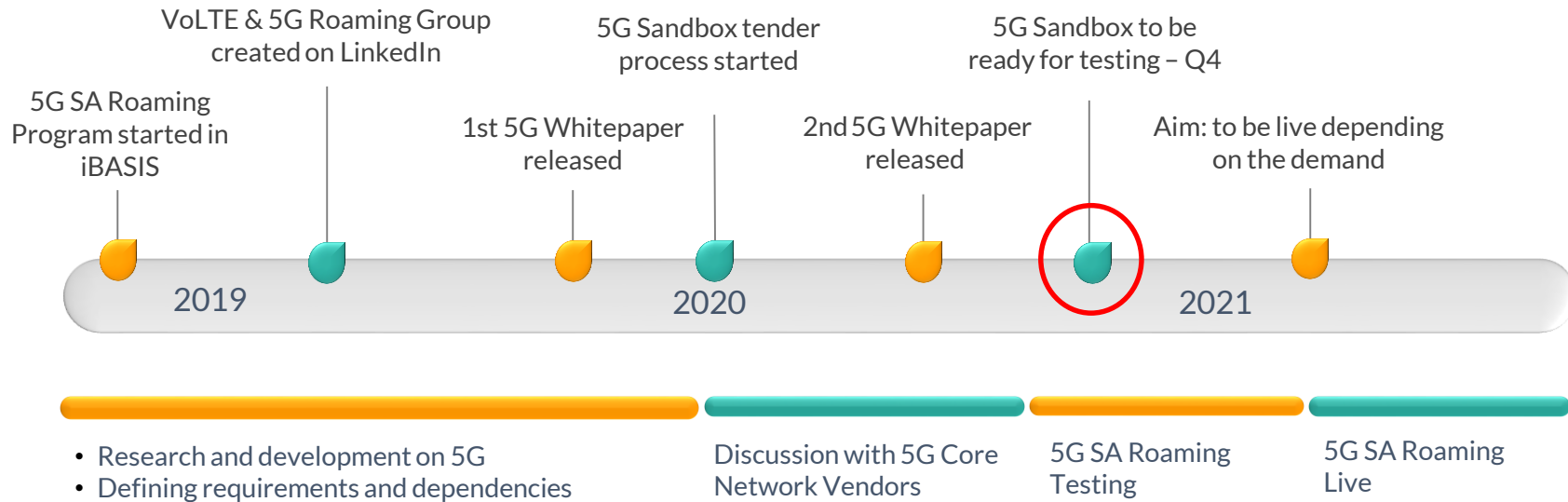# iBASIS - 5G READY - NETWORK EVOLUTION

iBASIS is able to:

- **interconnect SEPPs** of the MNOs
- provide MNOs a **hosted and managed SEPP**
- provide **additional** layer of security with **monitoring**, **signaling firewalls** and **DDOS** prevention

iBASIS - 5G READY - NETWORK EVOLUTION

5G Stand Alone

5G Non Stand Alone

Enhanced Security | Intelligent Routing | Local Breakout | Policy Control | 5G NSA Analytics | 5G SEPP | E2E Monitoring | 5G SA Analytics | Slice based Traffic Engineering

Highly reliable 100G backbone
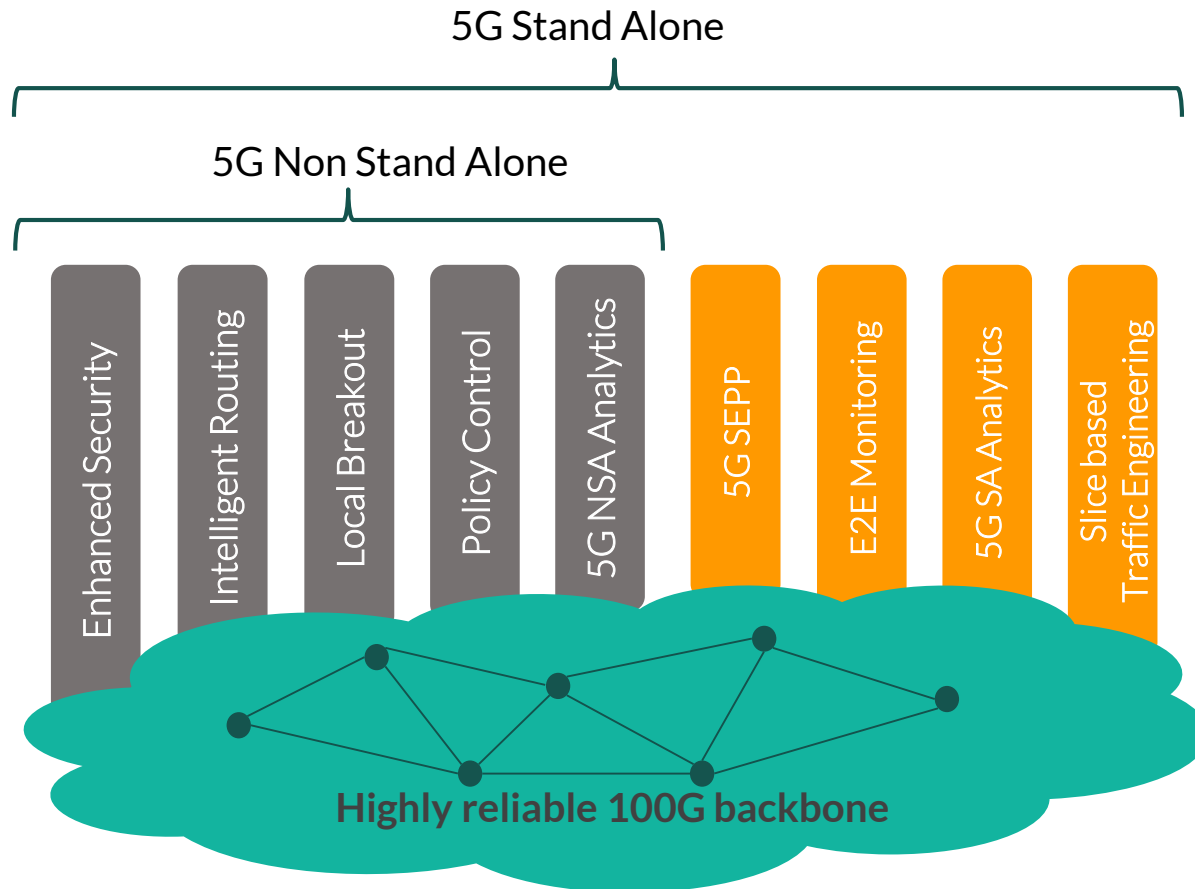
iBASIS 5G SIGNALING ALIGNMENT

iBASIS

5G SA Roaming Program started in iBASIS

VoLTE & 5G Roaming Group created on LinkedIn

1st 5G Whitepaper released

5G Sandbox tender process started

2nd 5G Whitepaper released

5G Sandbox to be ready for testing – Q4

Aim: to be live depending on the demand

2019

2020

2021

- Research and development on 5G
- Defining requirements and dependencies

Discussion with 5G Core Network Vendors

5G SA Roaming Testing

5G SA Roaming Live

- Contribution to 5G working groups in 3GPP & GSMA for "5G Interconnection models standardization"

- Local breakout is live and has been used for many years with unique iBASIS patents

- Live NB-IoT use cases as a driver of 5G massive Machine Type Communications (mMTC)

- Whole new security approach with enhanced monitoring, signalling firewalls and DDOS protection

LET'S CONTINUE THE DISCUSSION ABOUT THE 5G ROAMING JOURNEY
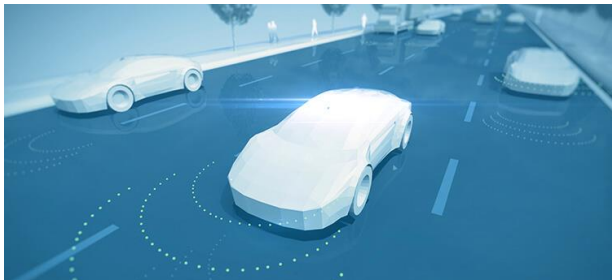
iBASIS

iBASIS INNOVATION EXCHANGE

Insights, webinars, data & demos for the exchange of new ideas

https://iBASIS.com/innovation/

VOLTE & 5G ROAMING ROUNDTABLE

Connect to LinkedIn Group for latest news and updates on upcoming virtual roundtable

https://www.linkedin.com/groups/8675420/

5G SIGNALING SANDBOX

5G Standalone (SA) Signaling testing for MNOs, Private 5G providers, and IPX peers.

Trials: contact@iBASIS.net

Conclusions & Wrap-up

Patrick George,
EVP Product & Business Development

iBASIS

Takeaways

Suggestions & Actions

Continue the discussion & join the

LinkedIn group:

https://www.linkedin.com/groups/8675420/