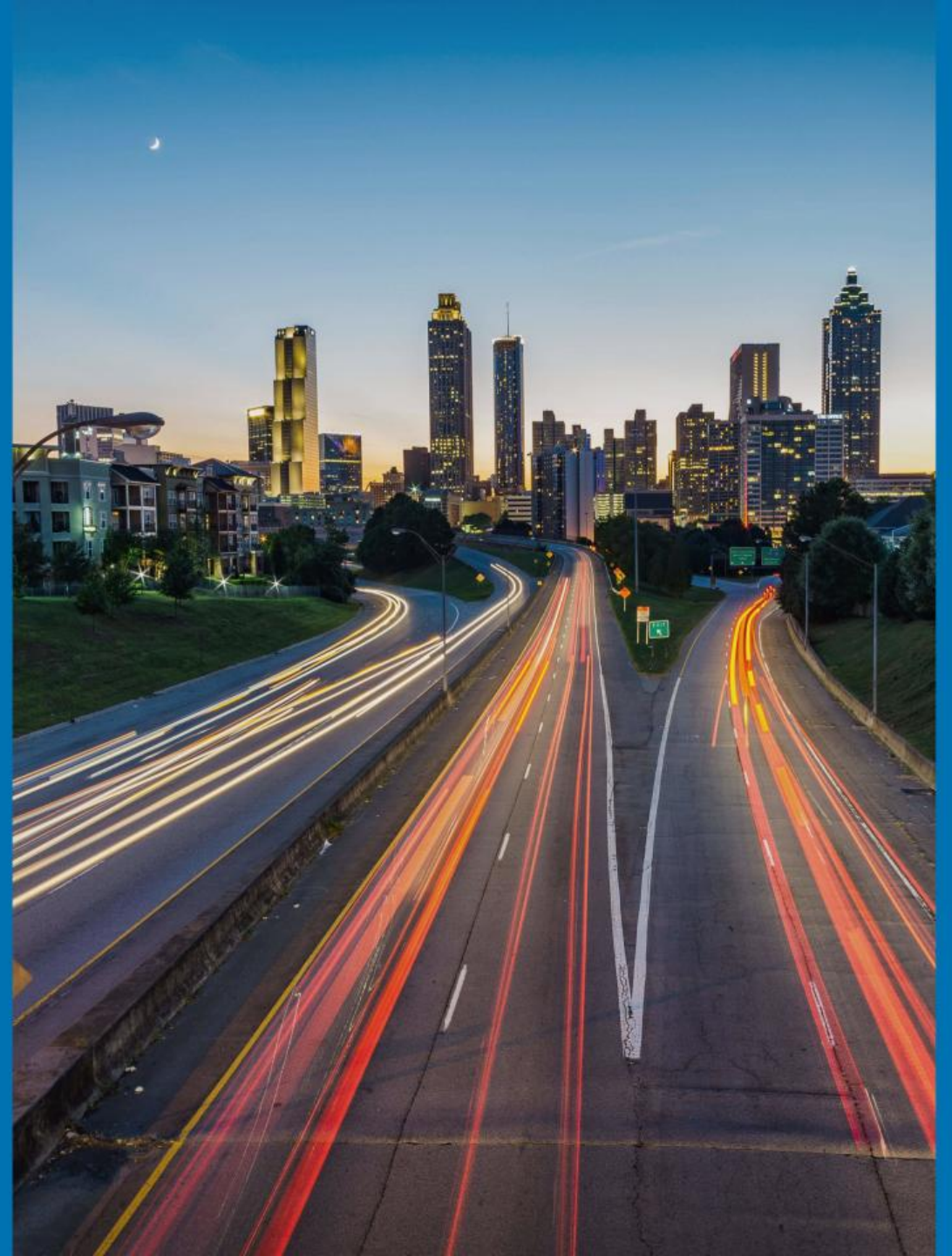


# 5G Roaming: MNO Requirements & Opportunities

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27th May 2020



# Presenters



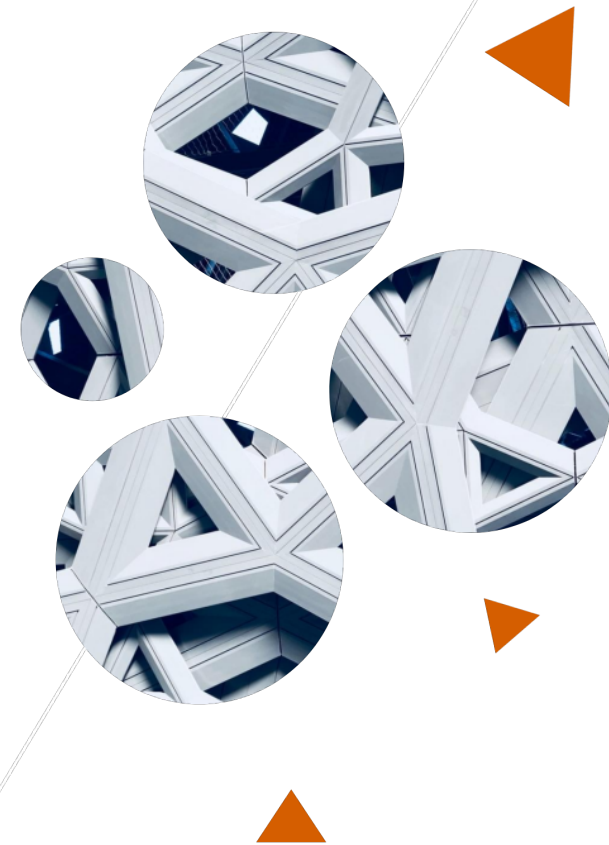
**NITIN BHAS, STRATEGY & INSIGHTS LEAD**  
**KALEIDO INTELLIGENCE**



**MEHMET TURUNC, SENIOR PRODUCT MANAGER**  
**iBASIS MOBILE SERVICES**



**STEFFEN SORRELL, RESEARCH LEAD**  
**KALEIDO INTELLIGENCE**



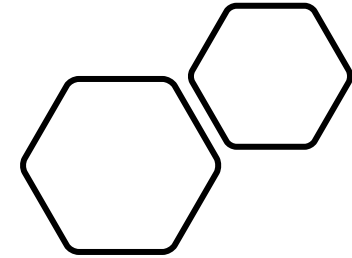
# Webinar Agenda



Kaleido Intelligence

**iBASIS**  
POWERED BY TOFANE

1. Introduction to White Paper
2. Key White Paper Findings
3. Recommendations for 5G success
4. Addressing the Operator need
5. Questions and Answers



# Introduction to the Survey & White Paper



60+

Number of Senior MNO Decision Makers surveyed in Q1 2020.



20 Questions

Assessed what changes 5G will bring for operators, which must be addressed if successful deployments, customer experience and profitability are to be achieved.



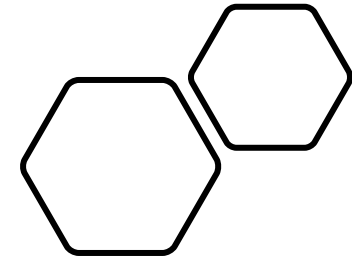
White Paper

What does 5G roaming mean for operators? What are the key technical and commercial requirements? Strategic recommendations for Operators.



5G Roaming Roadmap

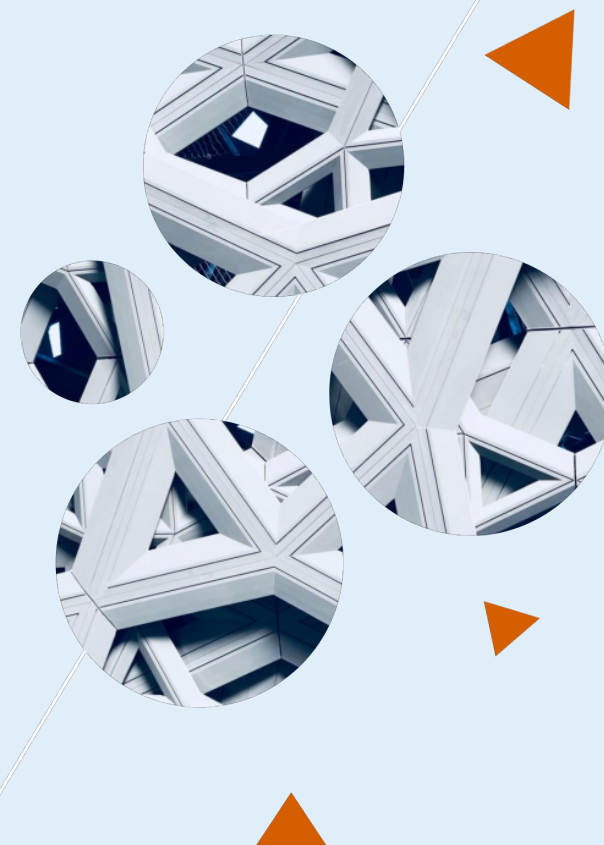
IPX, Signalling, Security & Clearing from a 5G SA and 5G NSA perspective.



# Key White Paper Findings

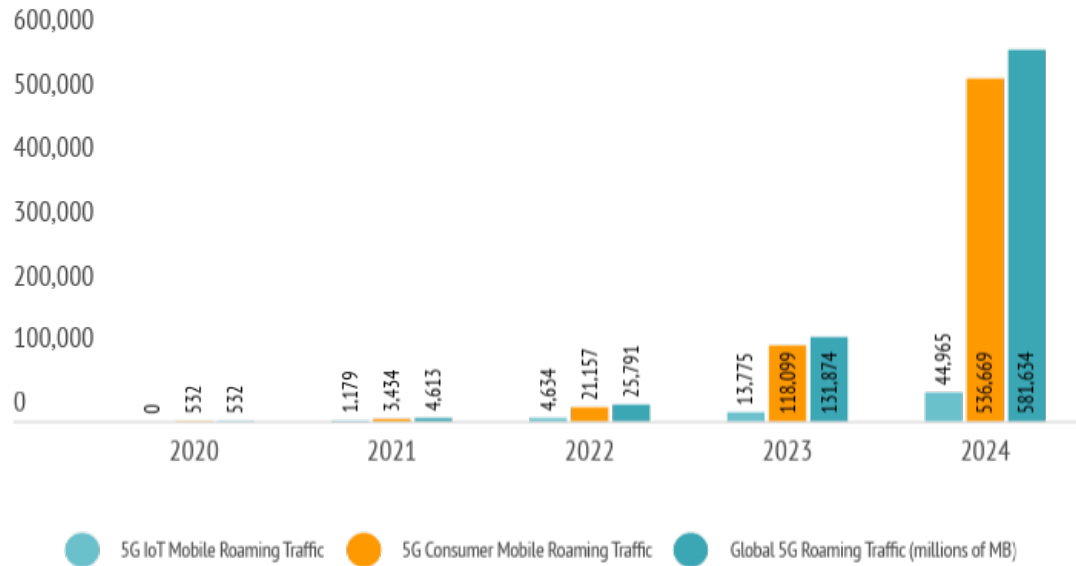


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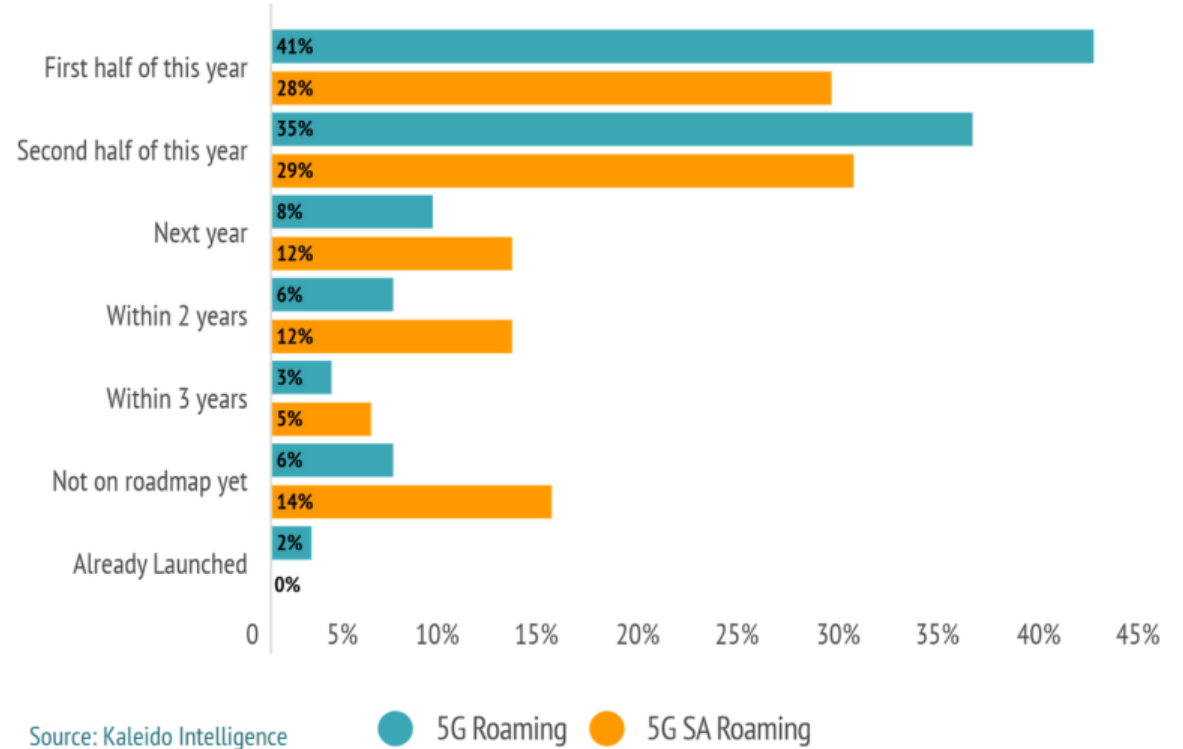
# Key White Paper Findings: 5G Roaming Plans

Global 5G Roaming Traffic in Millions of MB Per Annum, 2020-2024



Source: Kaleido Intelligence

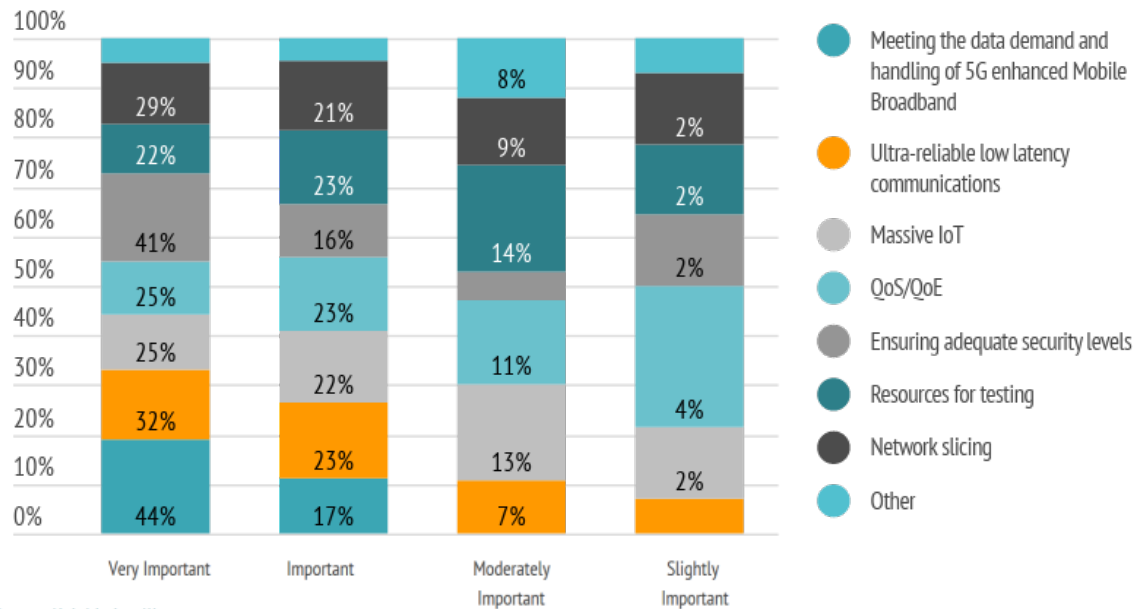
5G Roaming Deployment Plans: When will you launch 5G and 5G SA roaming? n=66



Source: Kaleido Intelligence

# Key White Paper Findings: Operator Priorities

Drivers for 5G IPX Deployment: What are the most important factors you consider to be needed for 5G IPX deployment? n=66



Source: Kaleido Intelligence



## Capacity for eMBB

Seen as very important by 44% of respondents



## Security

Adequate security 'very important' to 41% of respondents



## uRLLC, mMTC & network slicing

Lower priority at present



## 5G requires signalling evolution

Shift to HTTP/2, but co-existence with SS7, GTP, Diameter...



## SS7 will continue to be demanded

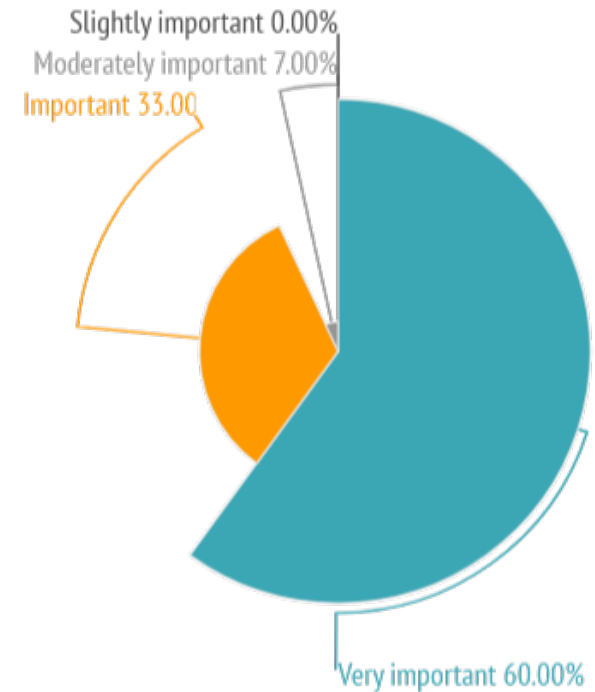
Particularly by existing IoT devices



## 5G means a greater attack surface

Requiring a robust security solution - converged solutions over standalone appliances are preferable

5G Roaming Services & Innovation Requirements: What kind of services or innovation you expect from your IPX provider?  
(Respondents answering with Signalling Interworking) n=66

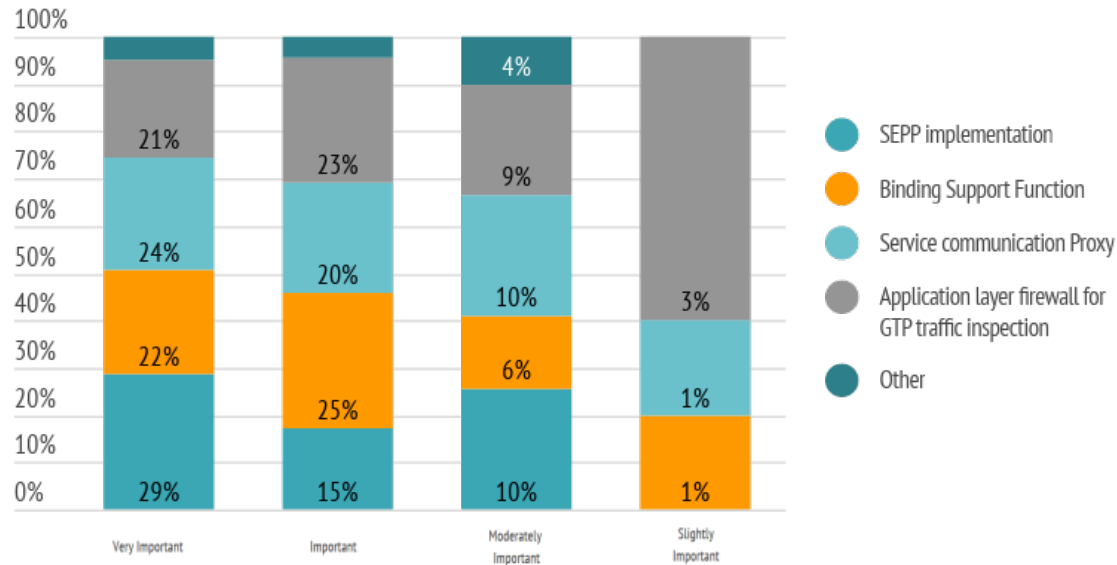


Source: Kaleido Intelligence



# Key White Paper Findings: 5G Security Requirements

Security Requirements for 5G Roaming: What are your security requirements for 5G & how do you expect your IPX provider to address these? n=66



Source: Kaleido Intelligence



SEPP is mandatory...

But may create challenges for roaming VAS



While network slicing presents security concerns

Due to requirement to access partners' NRF

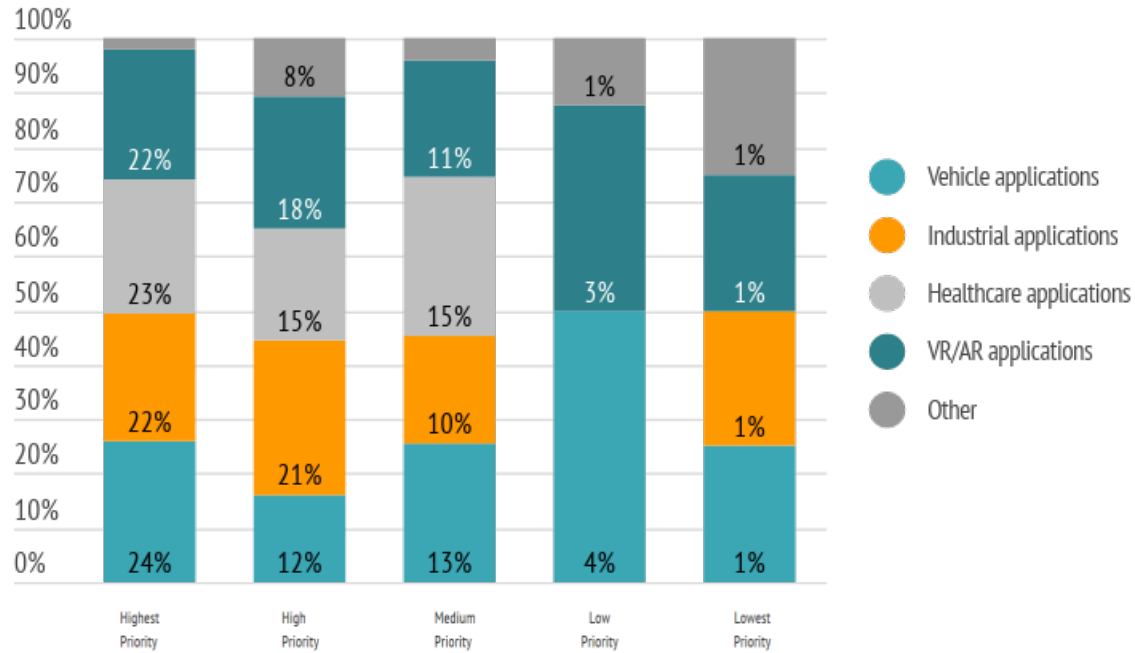


IPX providers can solve challenges here

Through hosted SEPP, and acting as trusted intermediary for network slicing

# Key White Paper Findings: Emerging Services

uRLLC Roaming Services Rollout: What are your plans for uRLLC services? Specifically, which international ones? n=66



uRLLC focus on vehicle & healthcare applications

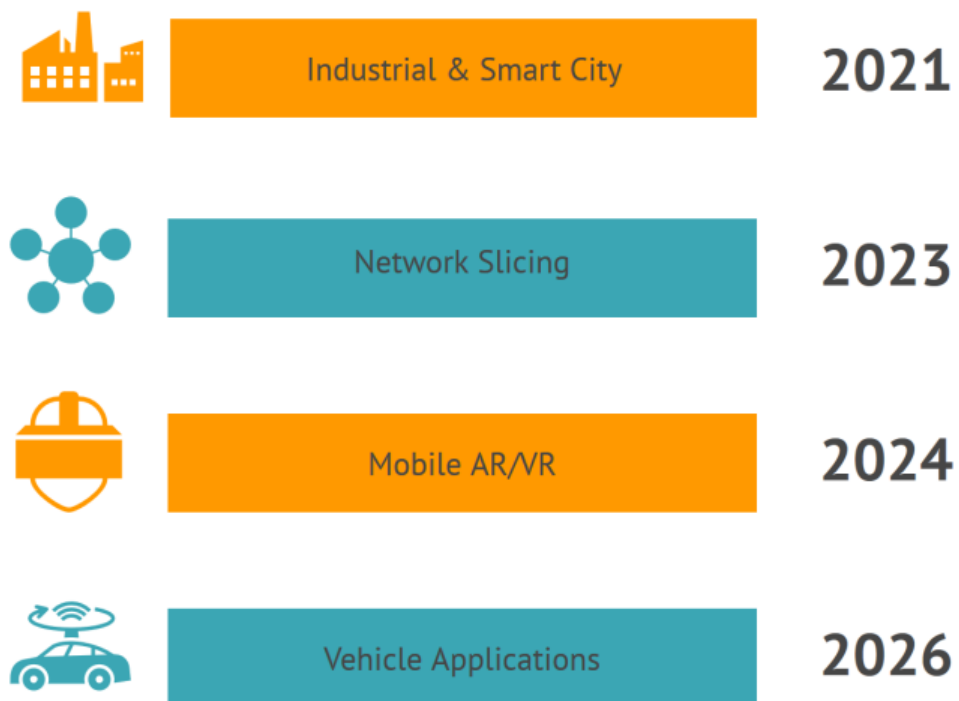
Longer term bets



uRLLC is enabled by edge computing

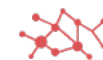
Which has immediate opportunities

# Key White Paper Findings: Edge Computing



4G private networks already in demand by industrial customers

Trend will accelerate in 5G environments - variance according to licencing, NR-U etc



Virtually all private networks benefit from access to macro network

Security becomes a key consideration



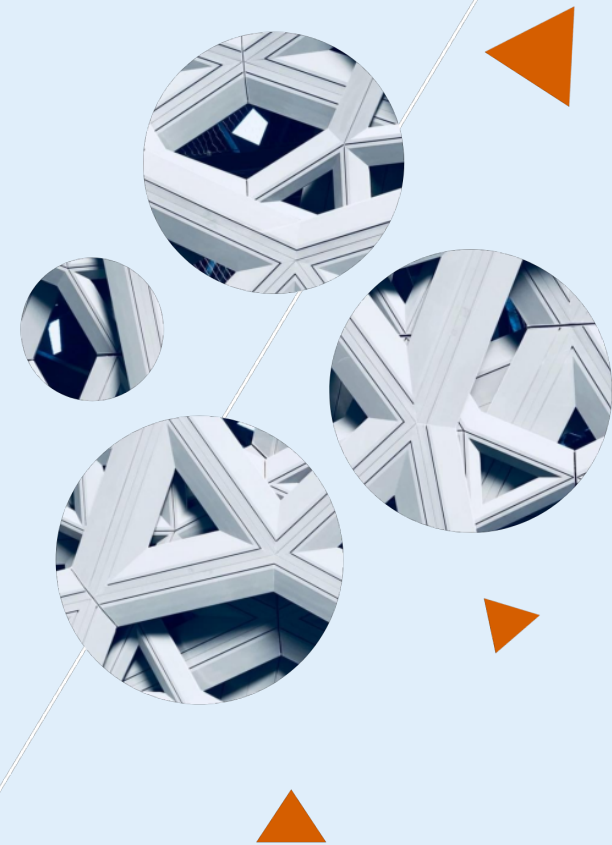
Support via network slicing requires high level of automation

How will the business model be managed?  
38% respondents: common standardised slices between roaming partners;  
27%: self-service models; 25%: federated slicing model.

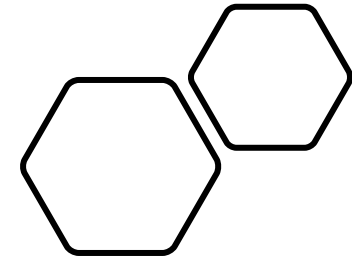
# Recommendations for 5G Success



**NITIN BHAS, STRATEGY & INSIGHTS LEAD  
KALEIDO INTELLIGENCE**



# 5G Roaming Roadmap for MNOs





## Define a 5G Roaming Strategy

Kaleido recommends that operators priorities and define a 5G roaming strategy and work with their roaming partners and IPX vendors.



## Emphasise on capacity, security and new signalling and interworking protocols.

Our survey confirmed the importance of interworking with 4G and private networks.



## Focus on progressing the migration from 4G core to 5G.

Enable the transition from NSA to SA network architecture in a seamless manner.



## Expedite VoLTE rollouts!

Necessitate this as the transition towards 5G SA commences.



## Focus on establishing 5G roaming use cases.

Prioritise establishing the roaming use cases presented by uRLLC and mMTC services enabled by 5G.



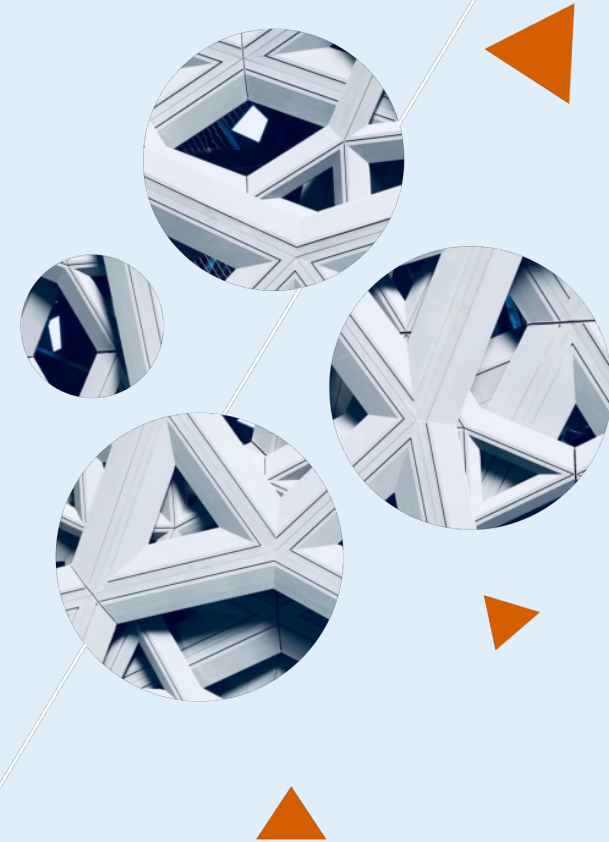
## IPX Partnership!

IPX solution offering greater flexibility and scalability in terms of 5G roaming solutions and infrastructure, ranging from signalling and steering to clearing and settlement.

# Addressing the Operator Needs



**MEHMET TURUNC, SENIOR PRODUCT MANAGER**  
**iBASIS MOBILE SERVICES**



# 5G ROAMING WEBINAR: MNO REQUIREMENTS & OPPORTUNITIES





# iBASIS RAPID GROWTH DUE TO CARVE-OUT ACQUISITIONS



SHAREHOLDERS

MANAGEMENT & FOUNDER

INVESTORS



M&A 2018



Ex-Portugal Telecom

ACQUISITION

9<sup>th</sup> GLOBAL OPERATOR  
VOICE PROVIDER

INTERNATIONAL LEADER  
ON VOICE AND ROAMING

13+ BILLION MINUTES

REMAINS

ALTICE PARTNER  
FOR

VOICE and MOBILE DATA

RETAIL



28 MILLION  
CUSTOMERS  
MOBILE

20 MILLION  
FIXED  
-LINE

CORPORATE



1 MILLION  
BUSINESS  
CUSTOMERS

M&A 2019



ACQUISITION

8<sup>th</sup> GLOBAL OPERATOR  
VOICE PROVIDER

TOP 3 IPX PROVIDER

700+ LTE  
DESTINATIONS

18+ BILLION MINUTES

REMAINS

KPN PARTNER  
FOR

VOICE, ROAMING, MOBILE DATA,  
TRANSMISSION and IoT



M&A 2020



ACQUISITION

\$141+ MILLION  
in REVENUES

2+ BILLION MINUTES

80+ VOICE  
CUSTOMERS

20+ SMS  
CUSTOMERS

7 GLOBAL EMPLOYEES

REMAINS

NOS PARTNER  
FOR

VOICE, SIGNALING,  
GRX and LTE

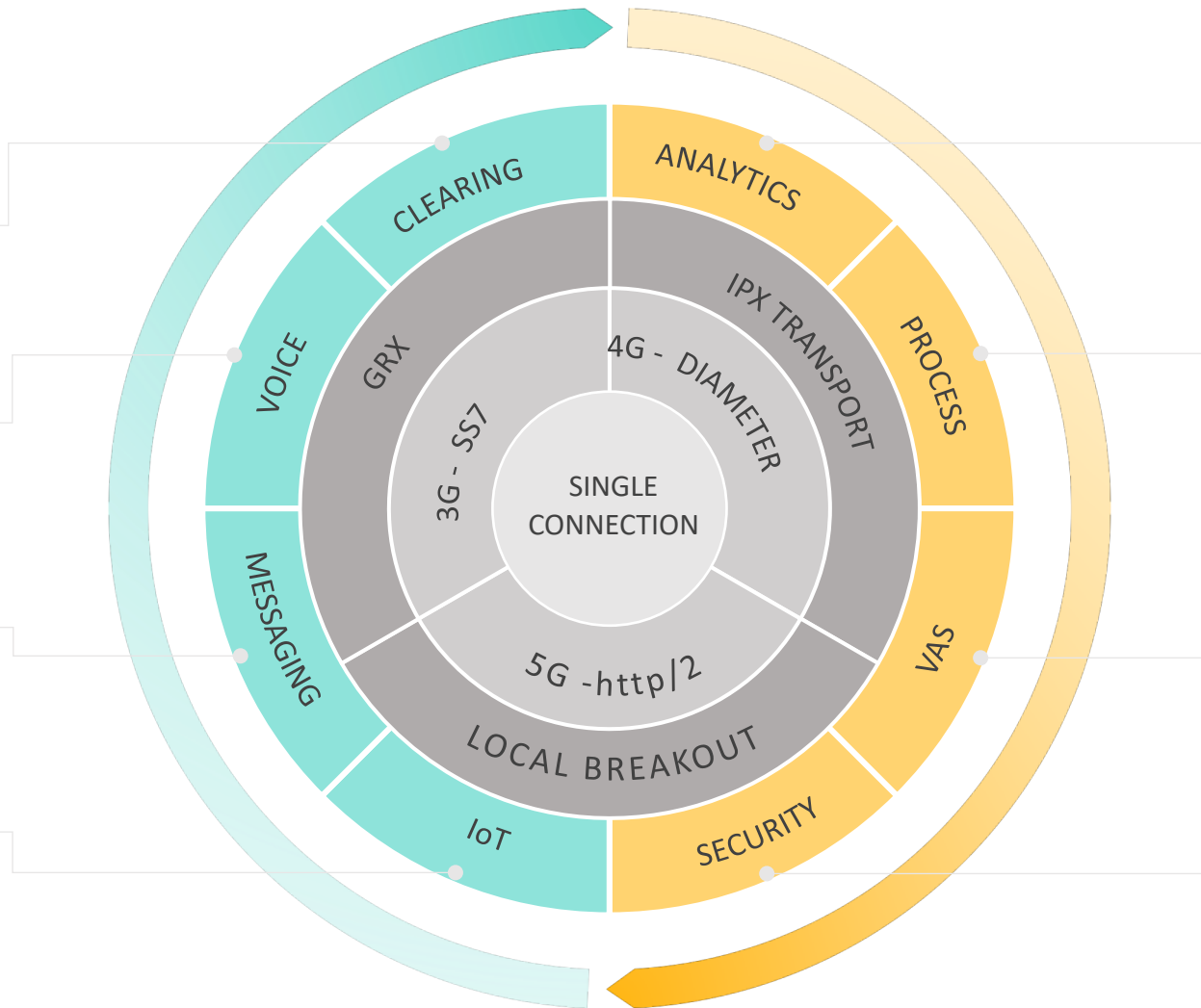
## OPTIMIZE REVENUES

Financial Clearing  
Data Clearing  
Settlements

VoLTE Roaming & Interconnect  
Voice Termination  
Cloud Communications

SMS A2P Termination  
SMS P2P  
SMS Firewall

IoT Data Access  
Local Breakout  
Policy Control



## OPTIMIZE COST

Quality Monitoring  
Troubleshooting  
User Insight

Sponsored Roaming  
Automated Trading  
Implementation  
Management

Steering of Roaming  
Welcome SMS  
Virtual Home  
Environment

Signaling Firewall  
Vulnerability Screening  
DDOS prevention

# GENERAL OUTLOOK ON 5G



4G

200-300 Mbps



5G

1-10 Gbps



300ms



3ms

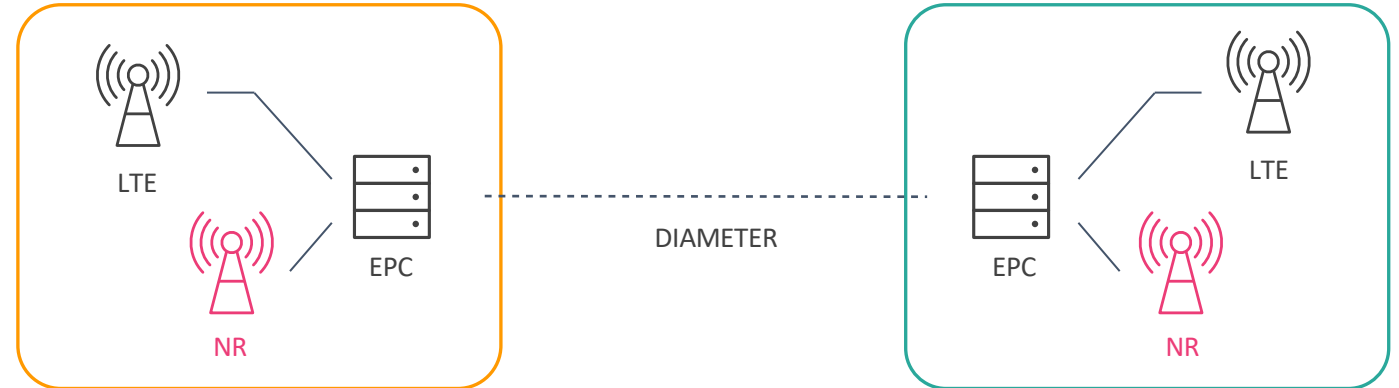
## 5G Outlook

Source: GSMA

57 live in 30 countries

88 planned in 30 countries

### Non-Stand Alone (NSA)



### Stand Alone (SA)



Home Network

5GC: 5G Core

NR: 5G Radio

Visitor Network

EPC: 4G Core

LTE: 4G Radio

# 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

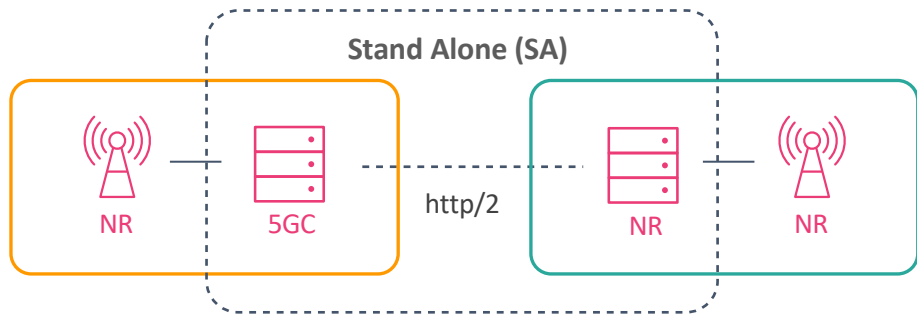
100G upgraded network

Innovation Lab – 5G Sandbox

Survey data based on 60+ participants

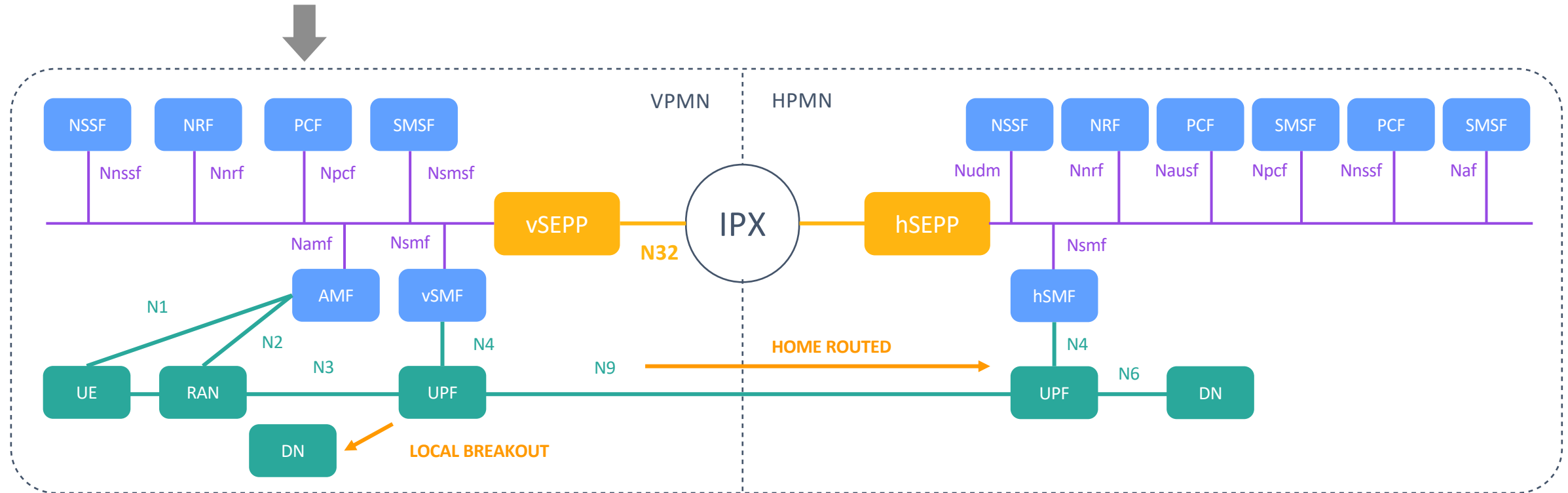
iBASIS preparations

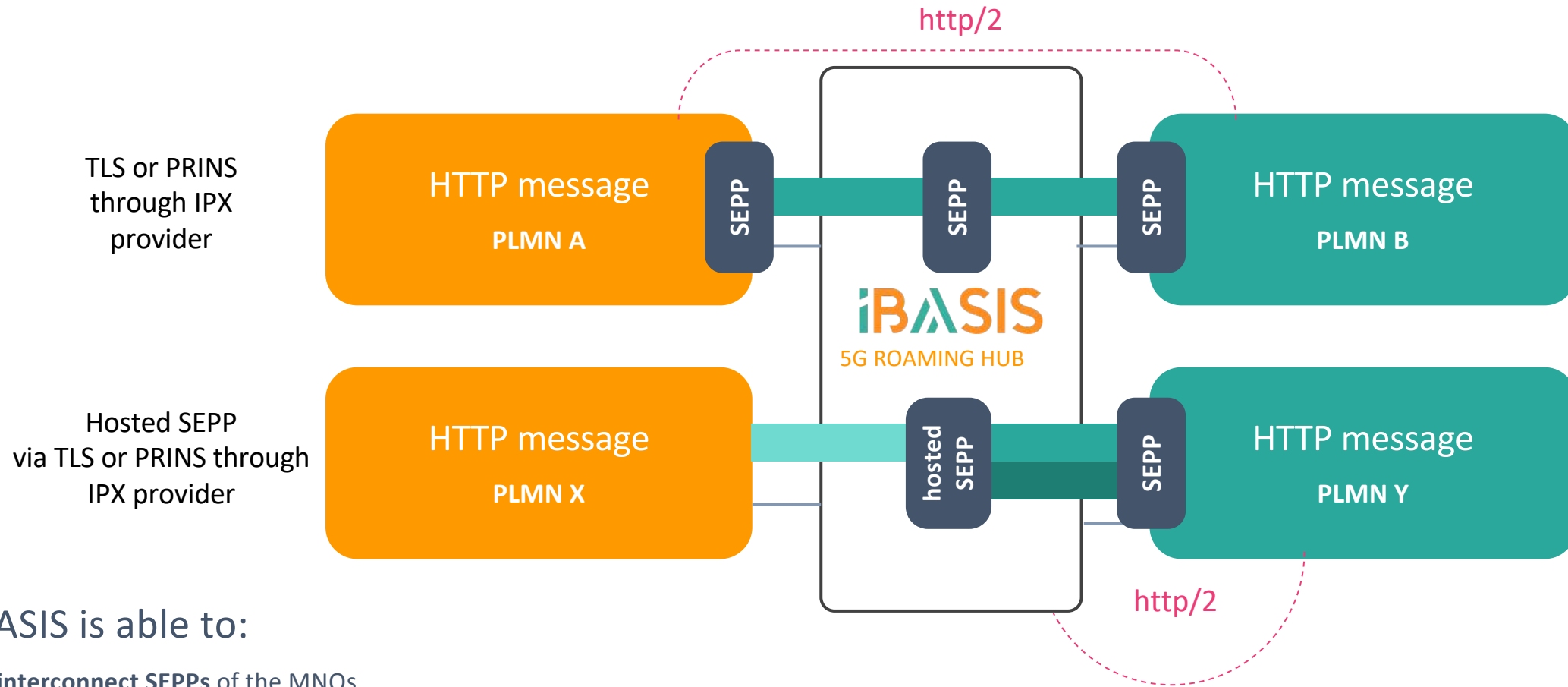
# WHAT ARE THE NEW FUNCTIONS IN 5G?



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

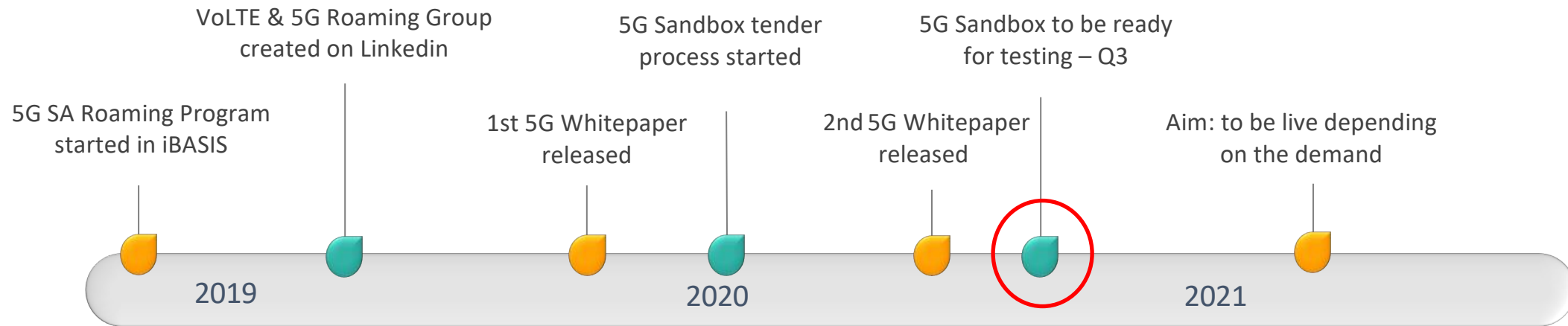
New signaling protocol: **http/2**





## iBASIS is able to:

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



- 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 signalling firewalls and DDOS protection



## 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/>



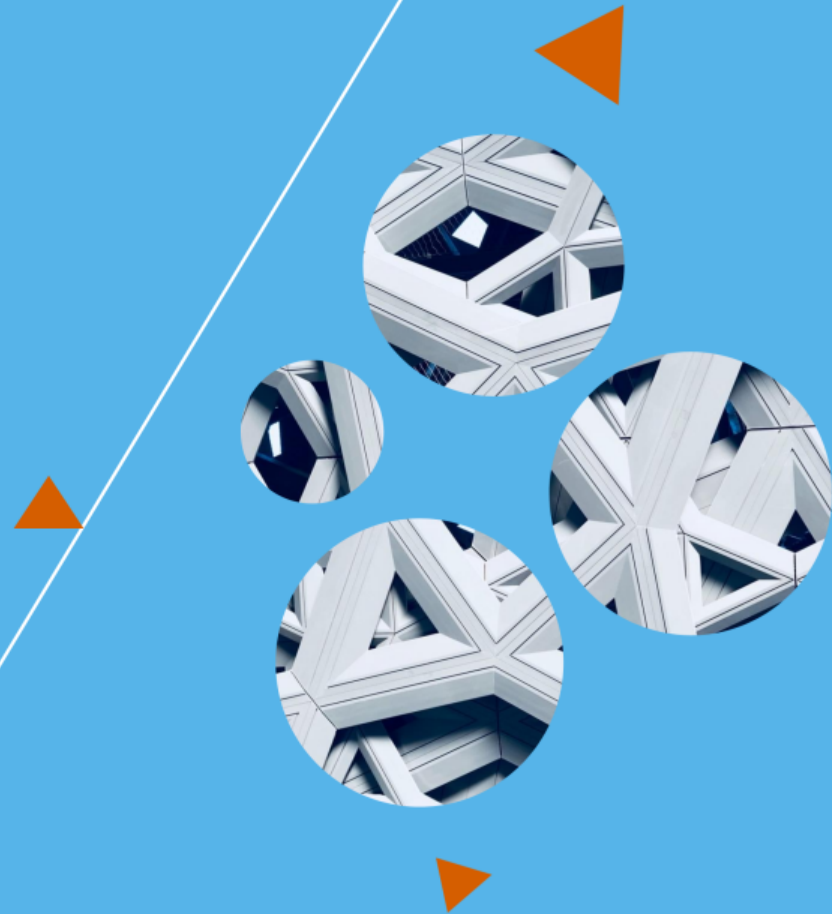
## 5G SIGNALING SANDBOX

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

Trials: [contact@ibasis.net](mailto:contact@ibasis.net)



# Questions?



# Thank you

For more information, visit

[www.iBASIS.com](http://www.iBASIS.com)

[www.roaming.kaleidointelligence.com](http://www.roaming.kaleidointelligence.com)



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