

WAS #9, 2019
WELCOME TO
VOLTE & 5G ROAMING
ROUNDTABLE

April 8 | Kuala Lumpur, Malaysia



AGENDA – MONDAY APRIL 8, 2019



07:50 – 08:10	Breakfast	
08:10 – 08:20	Welcome Session Objective & Agenda Introduction of all participants	Patrick George, EVP Product & Business Development
08:20 – 08:50	VoLTE Roaming key 2018 takeaways Feedback from recent survey Key discussion points	Chris Lennartz, VP Product Management Mobile
08:50 – 09:20	Evolution to 5G Survey feedback Key discussion points	Bill Welch, Product Manager Mobile Innovations
09:20 – 09:30	Conclusions & Wrap-up	Patrick George

ROUNDTABLE OBJECTIVE

Stimulate discussion and information sharing with Mobile operators on VoLTE Roaming and 5G Roaming

A pragmatic and interactive discussion, allowing early adopters to find each other and share their experiences

ROUNDTABLE INTRODUCTIONS

Please share:

- Name, Title
- Company



OUR RAPID GROWTH TO LEADERSHIP



PRIME PARTNERS

PORTFOLIO

VOICE LEADERSHIP

GLOBAL LEADERSHIP

COMMUNICATIONS LEADERS

FINANCIAL

MANAGED SOLUTIONS

SEPTEMBER 2018

FEBRUARY 2019

MANAGEMENT

INVESTORS



PRIME ADVISORS

Arthur D Little

Deloitte.

LAZARD

An end-to-end set of solutions with leading IPX and value added services

VOICE SOLUTIONS

MOBILE DATA SOLUTIONS

IoT CONNECTIVITY SOLUTIONS

supported by
SECURITY SOLUTIONS
and
BUSINESS INTELLIGENCE



ACQUISITION

9th GLOBAL OPERATOR BY INTERNATIONAL MINUTES

INTERNATIONAL LEADER ON VOICE AND ROAMING

+14 Bn VOICE MINUTES

REMAINS
ALTICE PARTNER FOR
VOICE and MOBILE DATA

RETAIL
 28 MILLION CUSTOMERS MOBILE
20 MILLION FIXED-LINE

CORPORATE
 1 MILLION BUSINESS CUSTOMERS



ACQUISITION

8th LARGEST GLOBAL VOICE PROVIDER

+18 Bn VOICE MINUTES

TOP 3 IPX

+660 LTE DESTINATIONS

REMAINS
KPN PARTNER FOR
VOICE, ROAMING, MOBILE DATA, TRANSMISSION and IoT

ONE GLOBAL TEAM

3RD LARGEST GLOBAL VOICE PROVIDER

TOP 3 for 4G connectivity

USD 1+ BILLION IN REVENUES

30+ BILLION MINUTES

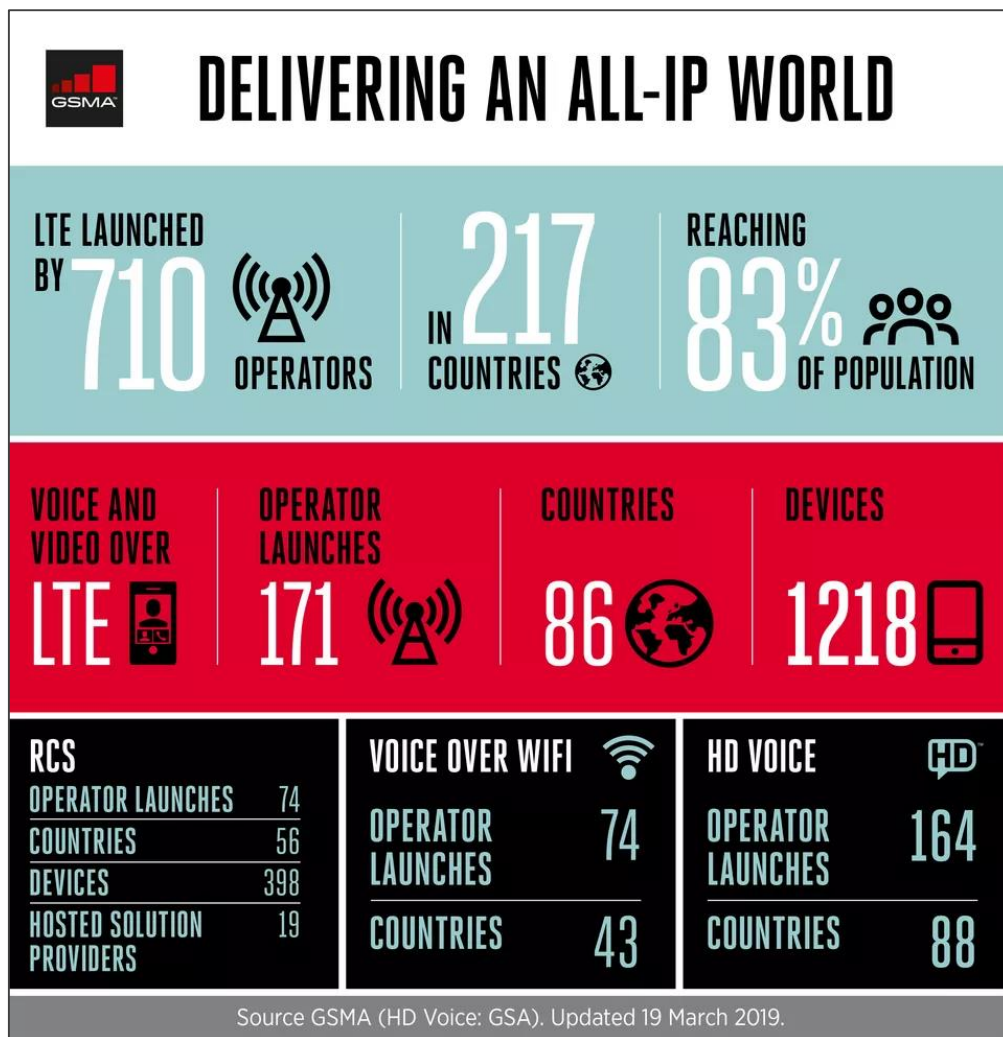
1000+ CUSTOMERS

300 GLOBAL EMPLOYEES

18 OFFICES

VOLTE ROAMING





Still positive trends from reports and projections

Question In Rocco report – Oct 2018:

What are your key businesses focuses for the coming year and how could IPX support them?

The first two answers are :

“VoLTE” x 61 MNOs

“VoLTE Roaming” x 18 MNOs



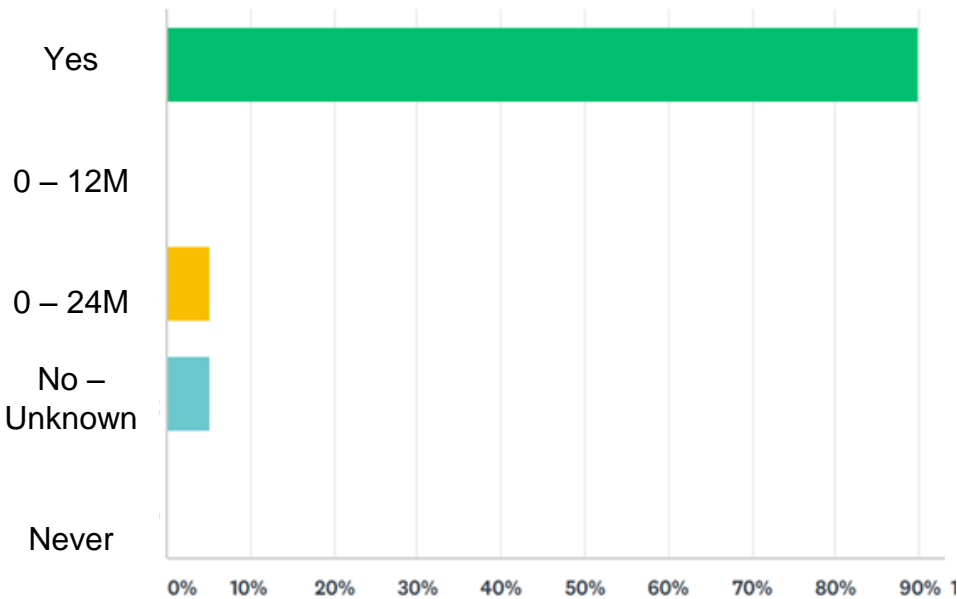
ROCCO

ANSWERS FROM OUR SURVEY ARE ALSO OPTIMISTIC...



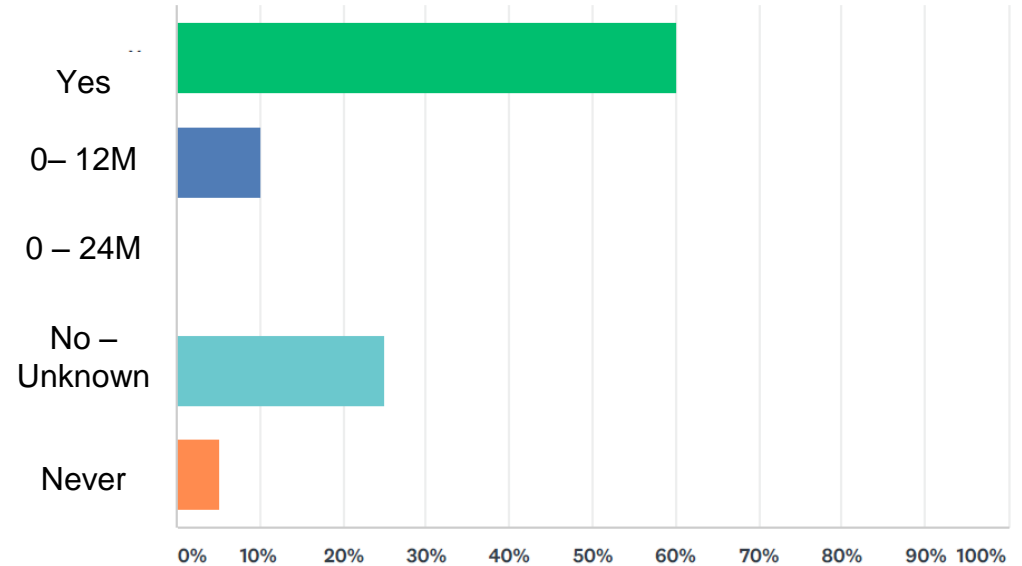
Q3 Do you have VoLTE deployed?

Answered: 20 Skipped: 1



Q4 Do you have VoLTE Roaming deployed domestically?

Answered: 20 Skipped: 1



However, in practice we don't see International VoLTE take off.....

KEY TAKEAWAYS FROM LAST SESSION

Identified issues are still a challenge

QUALITY: Shorter call set-up times -High voice quality- Significant improvement of customer experience vs 3G roaming ('CS fall-back')

HANDSETS: Different SIP clients on handsets: interoperability issues; low interest of handset manufacturers in fixing reported VoLTE issues.

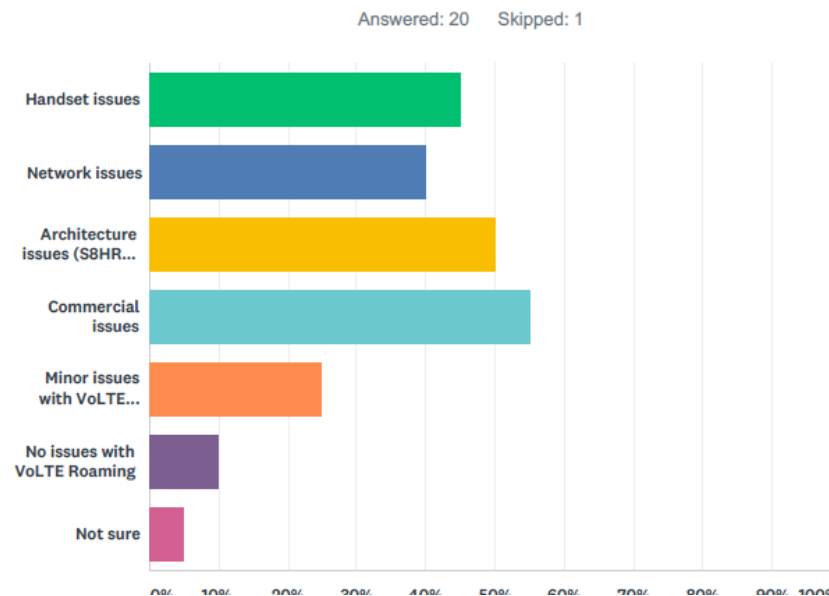
Greenfield LTE mobile operators disadvantaged by handsets switching to 3G in case of no LTE coverage and remaining on 3G

ROAMING ARCHITECTURE: S8HR is preferred model over LBO - Delay of voice calls routed back to home network with S8HR, not perceived as a real issue - Lawful intercept still a challenge with S8HR, solutions in some countries start to surface

COMMERCIAL DEPLOYMENT Inbound roaming business opportunities- Cost reduction to the network. - Common practice of using various APNs to make price differentiation between data roaming, voice roaming, and other roaming services over LTE - VoLTE interworking an essential part of an ecosystem for VoLTE hub ecosystem

VOLTE ROAMING PLAN FOR 2018 - Interest for both inbound and outbound roaming- Many expressed their ambition to implement several VoLTE roaming partners - Pending technical issue: how to ensure PLMN connected to all partners and still recognized as preferred

Q5 For VoLTE Roaming to have success, what issues need to be addressed? Please choose all that apply.



VOLTE KEY QUESTIONS

- What challenges generate this disconnect between reports, surveys and the reality?
- Your biggest challenge which restricts VoLTE roaming growth and why?
- What are the major advances you made in VoLTE in these areas since last meeting:

Commercial:

- Considering to launch Outbound Volte
- Pricing plan regarding Discounted IOT
- Better chance for Inbound roaming
- Launched VoLTE roaming
- Finally we got green light to start working on it.

Technical/operational:

- Lawful Intercept, Emergency call, and etc.
- Still waiting for lawful intercept solution
- Employment of device-based steering
- Easy to manage customer experience
- VoLTE Inbound operational
- Negotiate with current IMS provider to resolve bugs
- SH8R or deciding whether using S8HR or LBO

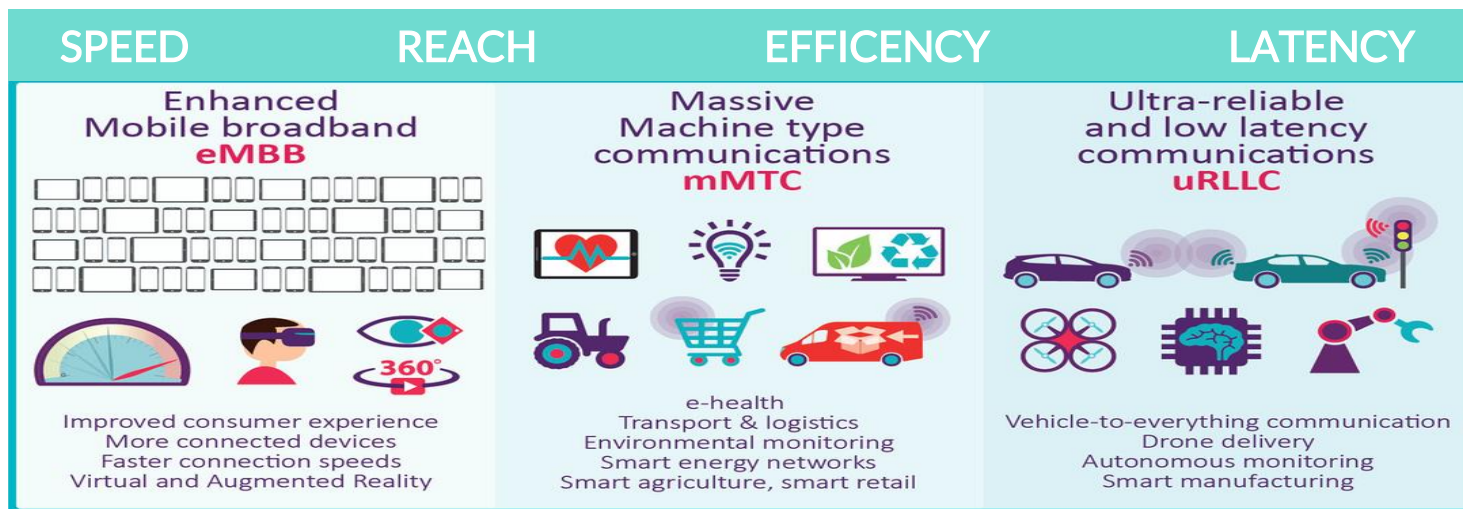
- Can 2G/3G shutdown as a deadline, be a motivation for deploying international Volte and why?
- How will VoLTE roaming over IPX contribute to the quality of roaming voice calls?
- Are the VoLTE Roaming Charging Model(s) hampering roll out?
- What about RCS in relation to VoLTE - do you still see that as a development priority?
- With 5G/IoT around the corner, will International VoLTE become a lower priority ?

THE ROAD TO 5G

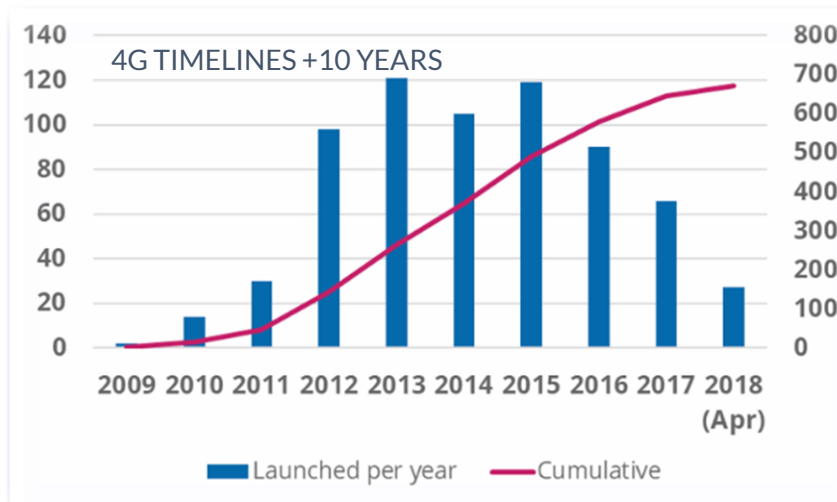


WHAT AND WHEN 5G ROAMING

What will 5G Roaming bring?

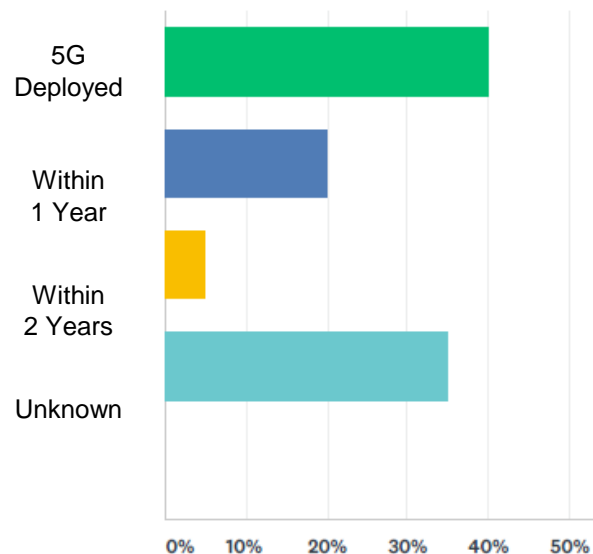


When will 5G Roaming get here?

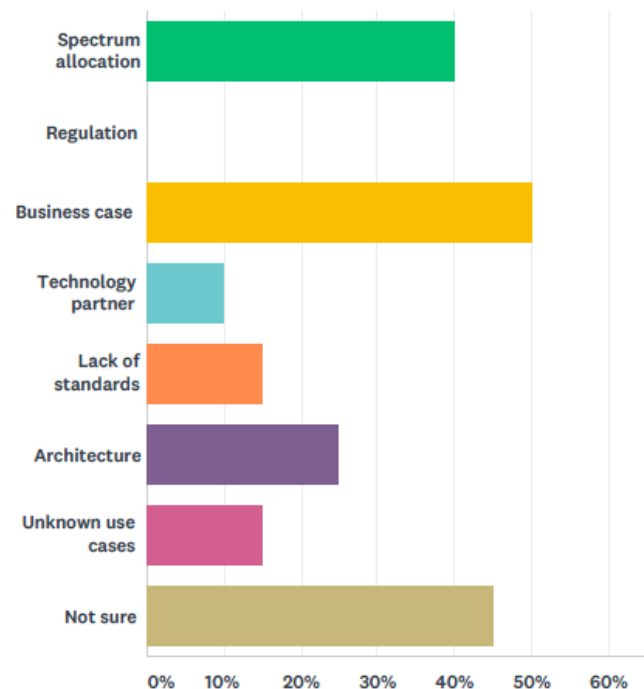


GROUP SURVEY RESULTS – 5G

5G Deployment Plans



5G Challenges



- Are Spectrum issues resolved with 2/3G shutdowns?
- How are you going about resolving the business case problem? Do limited commercial trials help?

KEY 5G QUESTIONS

- Lots of unanswered problems
- Problem areas –
Business case, Not sure, Spectrum, Architecture, Unknown use cases and Lack of Standards
 - Are there other problem areas we should be discussing?
- Is now the right time to tackle the 5G Roaming topic?
 - What does the next 6 -12 months look like for you on 5G and 5G roaming?
- Is VoLTE roaming a requirement before 5G Roaming is realized?
- What do you expect from the IPX provider, compared to what we do now?
- Are there (international) 5G use cases and experiments that you can share?



ROCCO SURVEY



5G ROAMING – WHO’S LOOKING



- ROCCO developed two surveys with guidance from Tier 1 MNOs about what they wanted to understand about 5G and LPWA Roaming and then asked all MNOs to give their view on the questions.
- **5G / LPWA Roaming – Are We Ready? Report 2019**
- 60+ MNOs Responded to the surveys we conducted including for 5G, 32 Tier 1 MNOs in the USA, Japan, China, UK, Germany and major MNO Groups.



Roaming Business case:
The association between the commercial viability of 5G and the growing IoT industry is undeniable

61%

BY 2020 61% EXPECT TO HAVE 5G FOR DOMESTIC

28%

BY 2020 28% EXPECT TO HAVE INTERNATIONAL ROAMING

50%

OF MNOS CONSIDER ROAMING TO BE A MAJOR FACTOR IN ROLLOUT

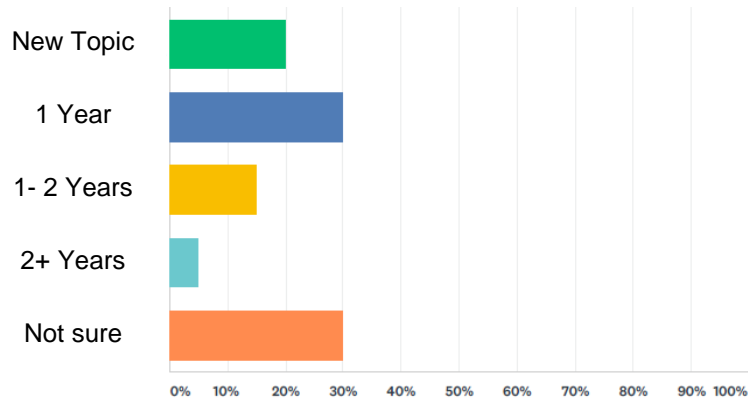
72%

OF MNOS STATED THEY ARE ALREADY HAVING ROAMING TRIALS

WRAP UP



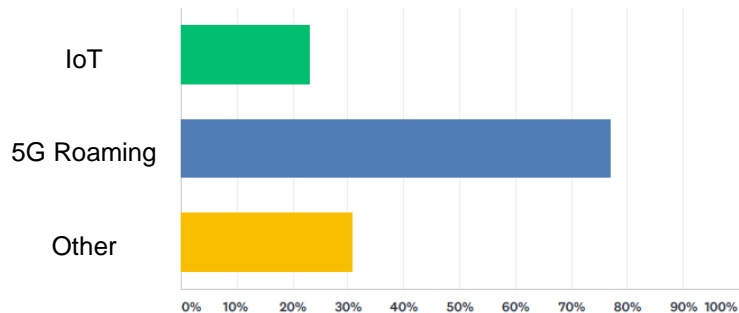
Stay with VoLTE or move on?



No clear answer on if we should move on from VoLTE
Roaming topic:

- Continue with VoLTE for one more year and then revisit question at the next session?
- 5G Roaming is the clear favorite for new topic and add 5G Roaming to discussion group?

Next Topic?



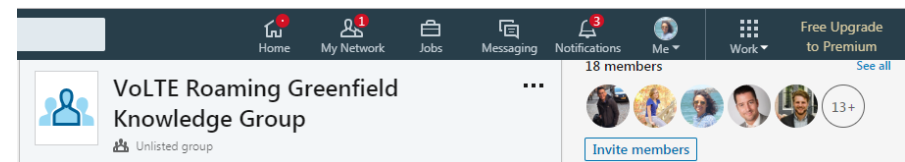
ROUNDTABLE HIGHLIGHTS SUMMARY

Takeaways

Suggestions & Actions

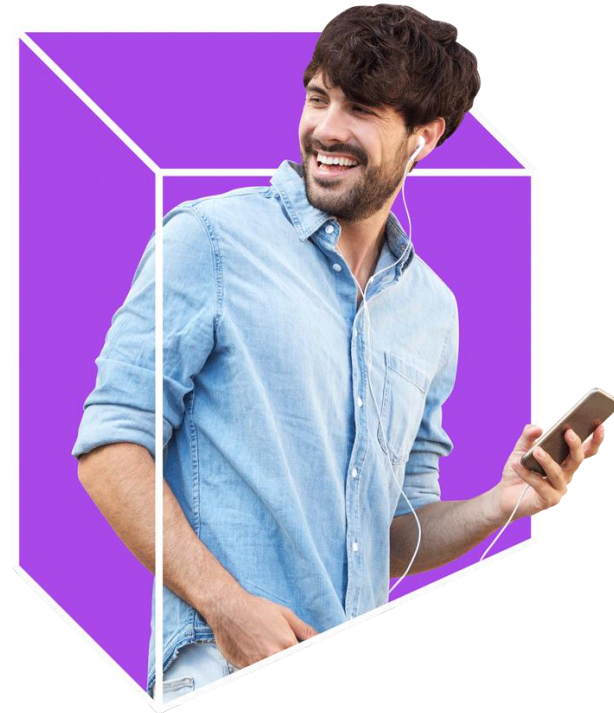
Next Steps

Continue the discussions &
join the LinkedIn group:



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

BE THERE FIRST



iBASIS.COM