



Preferred choice for PMR

ONE NETWORK. INFINITE POSSIBILITIES.

2/7/2022

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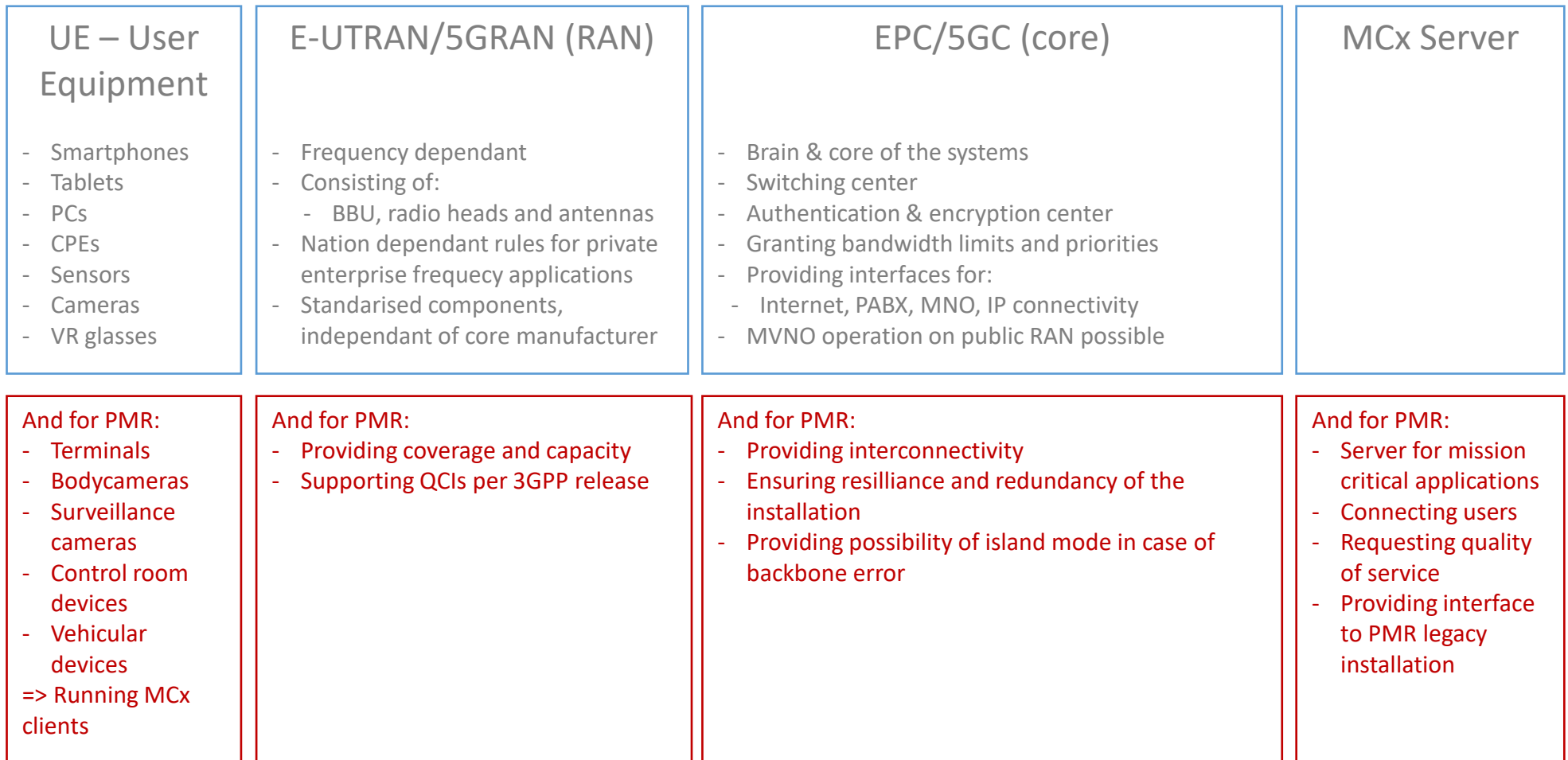
Why PMR on 4G/5G?

- One system and one network covering all needs:
 - Video, Data, Voice
 - Tele-medicine, virtual reality, sensors, logistics, augmented reality
 - Automation, robotics
- Providing you with:
 - Full control on bandwidth per device
 - Approved / licensed spectrum (no sharing)
 - Priorities and reliability
 - Scalable and planned coverage
 - Interoperates with legacy PMR installations
- Only one system to maintain:
 - Simplified service and maintenance
 - Caring for increased demand of bandwidth also in PMR
 - Cost saving and future proof
- Today's challenges in PMR:
 - Too small bandwidth
 - Too many systems
 - Future proof investment
 - Deep IT integration
 - Security

What is MCx?

- Any application could run on a smartphone, providing some group / PTT communication, but...
- **MCx does go far beyond:**
 - MCx is specified by 3GPP in collaboration with ETSI
 - It is a standard deeply integrating into 4G (5G) infrastructure
 - Plugtests constantly performed, integration assured
- **MCx consists of the following elements:**
 - MCx server – running in the backbone centrally or better decentralised
 - MCx client – running on user equipment
 - MCx dispatcher – running in control rooms
 - MCx gateways – providing service to legacy PMR systems and PABX
- **MCx defined services:**
 - Mission Critical Voice, Data, Video, Emergency / Man-down
 - FRMCS – future rail mission critical services
 - Geofencing, Gelocalisation
 - Control room management systems
 - More to come
 - Currently on 4G, but with 3GPP release 17 also for 5G

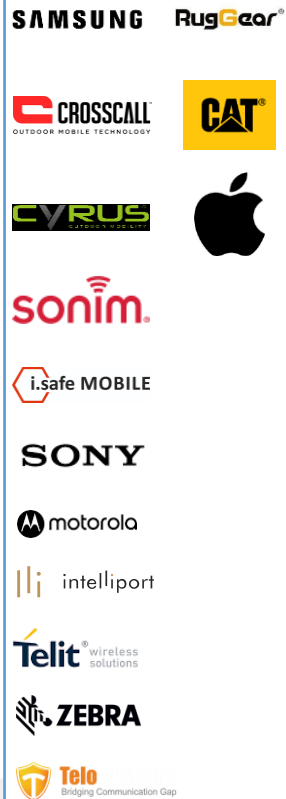
4G / 5G architecture & components



Providers

Non-complete list, just examples

UE – User Equipment



E-UTRAN /5GRAN (RAN)



Many small cell vendors

EPC/5GC (core)



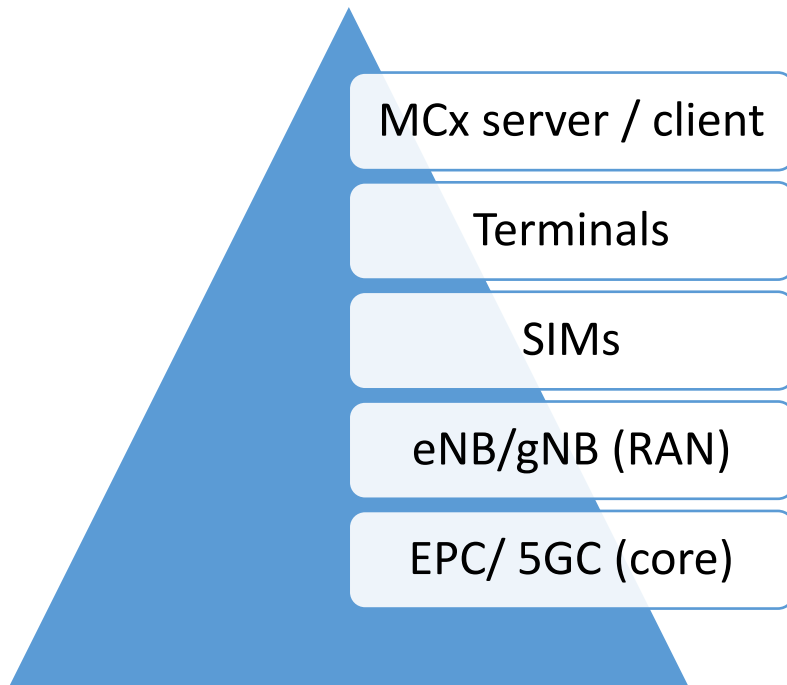
Also as MVNO core with all major core vendors through existing or supplemented RAN infrastructure

MCx Server



Independency

Required components:



A)


ATHONET
 one stop shopping & integration

- Streamwide, Alea (Talkway)
- Crosscall, Ruggear, Samsung, Tello, Siemens CPE
- Athonet
- Airspan, BTI, Nokia*
- Athonet

B)

Full system integration

- Choose your own
- Choose your own
- Athonet
- Choose your own, agnostic to any
- Athonet

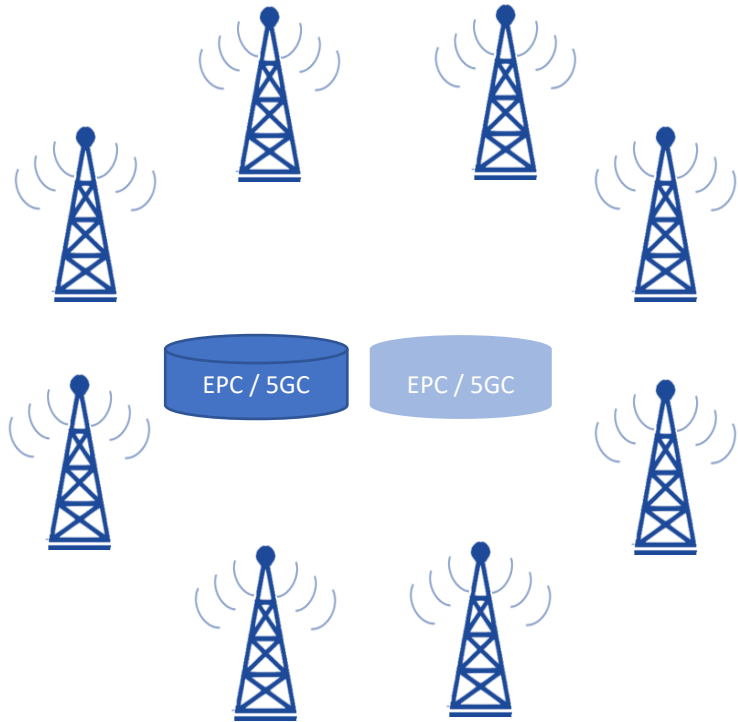
Or any solution in between!

*subject to individual customer approval

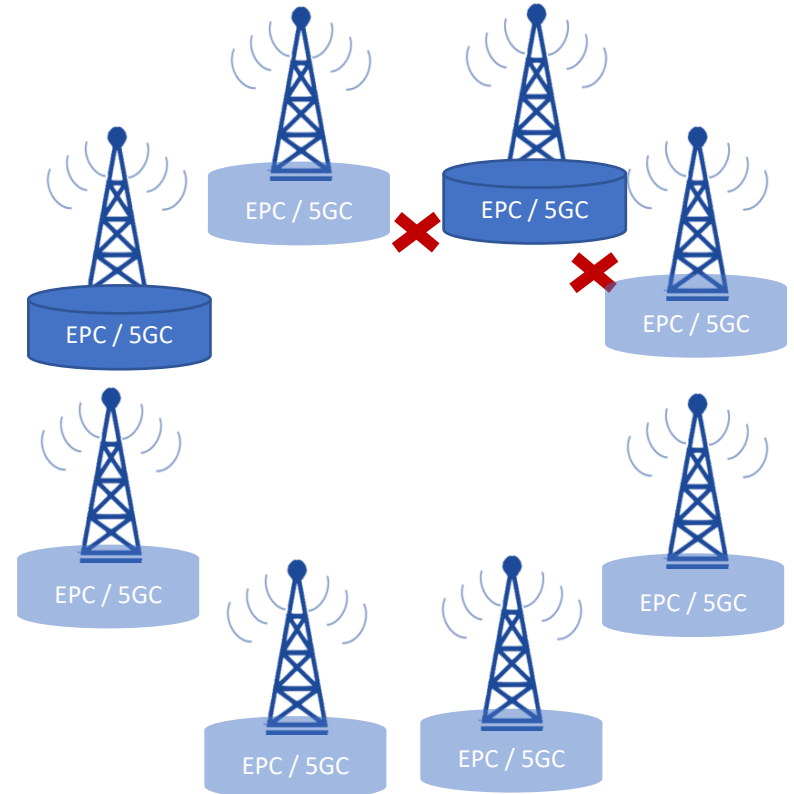
Coverage / Frequency comparison PMR

- 4G frequencies available in 400MHz, 700MHz, 1GHz, 2GHz, 3.5GHz
- The larger the frequency, the larger the available bandwidth
- Coverage equal to PMR due to:
 - higher BS-TX output power
 - more robust modulation options
 - MiMo
 - higher BS-RX sensitivity
- LoS allowing up to 70km coverage
- Urban also equal to PMR, reflections assist in higher frequencies
- Easier setup than in PMR for indoor via Micro cells

How reliable is your network? - Centralised vs. decentralised



Standard carrier configuration
geo & local redundant



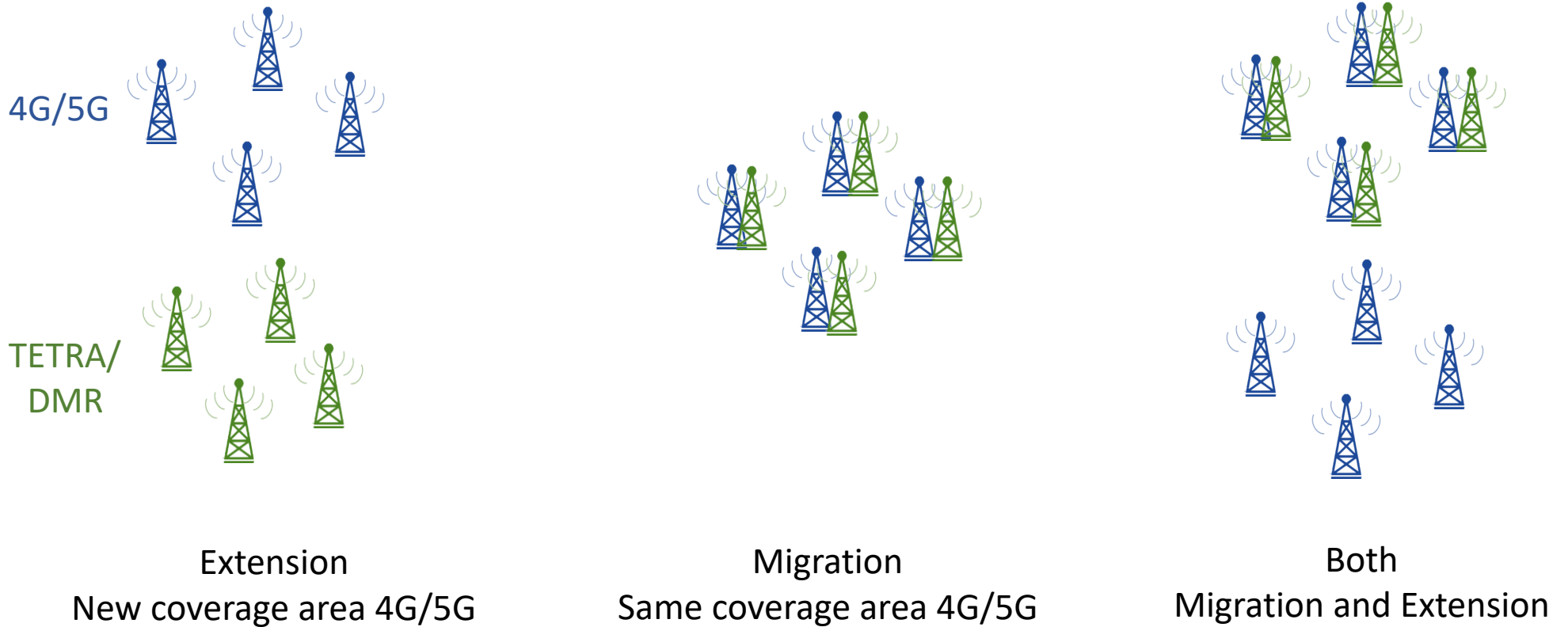
High resilience / redundant configuration
Mission Critical Grade
(also geo & local redundant)



can scale from centralised to fully decentralised

⇒ Important to start also local MCx server for local island communication mode (IOPS)

Migration / Extension on existing PMR installation



Integration principles

4G/5G

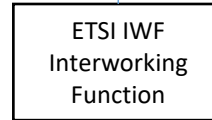
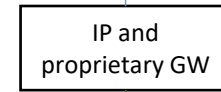
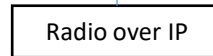
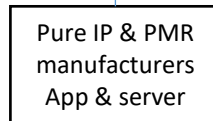
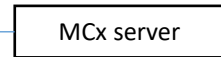


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2.)

3.)

4.)



TETRA/
DMR



either ... or ...

<p>✓</p> <ul style="list-style-type: none"> - Full integration - All PMR features - Less components 	<ul style="list-style-type: none"> - one-stop shop - Integration to any PMR network - Support via Athonet 	<ul style="list-style-type: none"> - Flexible MCx choice - Best customer adaptation 	<ul style="list-style-type: none"> - Standard solution - Vendor independent
<p>⊘</p> <ul style="list-style-type: none"> - No priorities/QoS - Proprietary solution - Limited feature set 	<ul style="list-style-type: none"> - Limited integrated features - Single point of failure - Air interface 	<ul style="list-style-type: none"> - Gateway integration limits solution - Solution per PMR system required 	<ul style="list-style-type: none"> - Still defined by ETSI - Not yet fully implemented at each vendor

Migration Strategy from 4G to 5G

- For Athonet, this is just a software update
- Applications may require adjustments to the interfaces
- Several RAN vendors offer the same
- MCx requires minimal interface adaptation
- Devices will require a replacement, only few are 5G prepared today

Support & cooperation

- **Support level choosable**
 - Software upgrade only
 - 8x5 support
 - 24/7 support
- **Cooperation with system integrator**
 - Customer -> first level
 - System integrator -> second level
 - Athonet -> third level
- **Managed networks possible**
 - Either via System Integrator
 - Or directly via Athonet

Summary

- Private 4G/5G solutions are available today
- They grant services beyond mission critical voice
- Athonet:
 - Is specialised in vertical markets and dedicated to private networks
 - Has built the right eco system around our own product
 - Has proven track record and experience of reliable global installations
- **Athonet solutions is:**
 - Cost effective
 - Professional grade
 - Vendor agnostic for RAN, terminals and MCx
 - Easy to use

Putting you in control of your network,
devices, applications and users!

