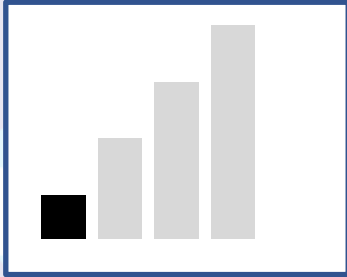


Build your own 5G

Use cases - 4G or 5G - how to keep it simple



When your mobile operator fails to deliver any meaningful signal...



... or you have data that shall not be carried over public networks

When your Wifi does not reach all desired locations



Wifi reliability may also be an issue...

When there are simply too many public network users



You can now build your own mobile network

If you keep it simple no special expertise is required

Private mobile network services



Connecting IoT devices or IoT hubs



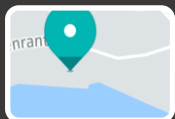
Education, healthcare, e-government, messaging



In vehicle terminals for IT integration



Remote control of machines + video for safety/surveillance



Location services for asset tracking



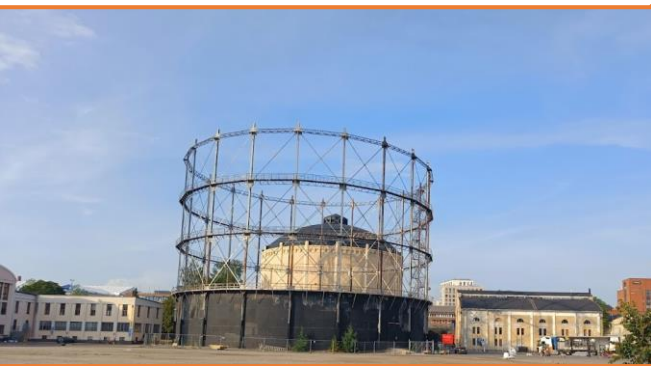
Group communication



August 2022, Helsinki Suvilahti – old industrial environment (tough for radio)

Maximum reliability:

- Two separate frequencies (as interference from TV crews expected)
- Three base stations connected to three mobile cores



pouta

pouta

4G or 5G

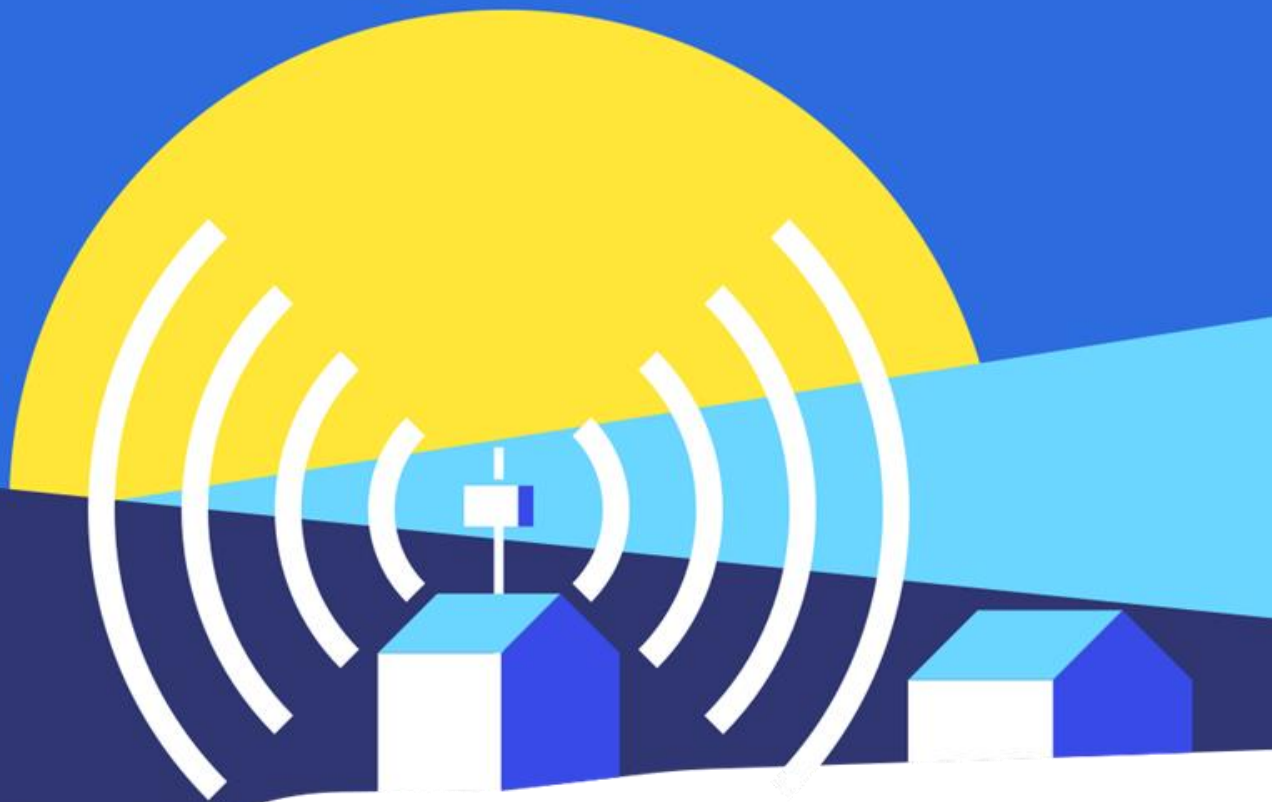


4G or 5G Standalone

In Finland	4G	5G SA	Notes
Frequencies	20MHz at 2,3GHz (B40)	100MHz at 25GHz (2,3GHz can also be used), new spectrum around 4GHz?	At 25GHz line of sight is needed. Not practical for building coverage.
Cell capacity	Up to 120 Mbit/s with 2 antennas, DL/UL splits e.g. 110/10 ... 50/30 ...	With 100 MHz >> Gbit/s	5G has a wide variety of options that impact cell capacity.
Minimum system cost	Pico eNB + opensource core + PC ...less than 2000 €	Opensource and small gNB not readily available. 15k€...	5G unlikely to become as cheap as 4G.
UE availability	Most devices work with B40 and support private networks.	It's still a mess for IoT. Check upfront.	5G SA ecosystem should be ok within a few years.

Note: 5G NSA (non standalone) is just 4G + additional capacity. Not useful for private networks.

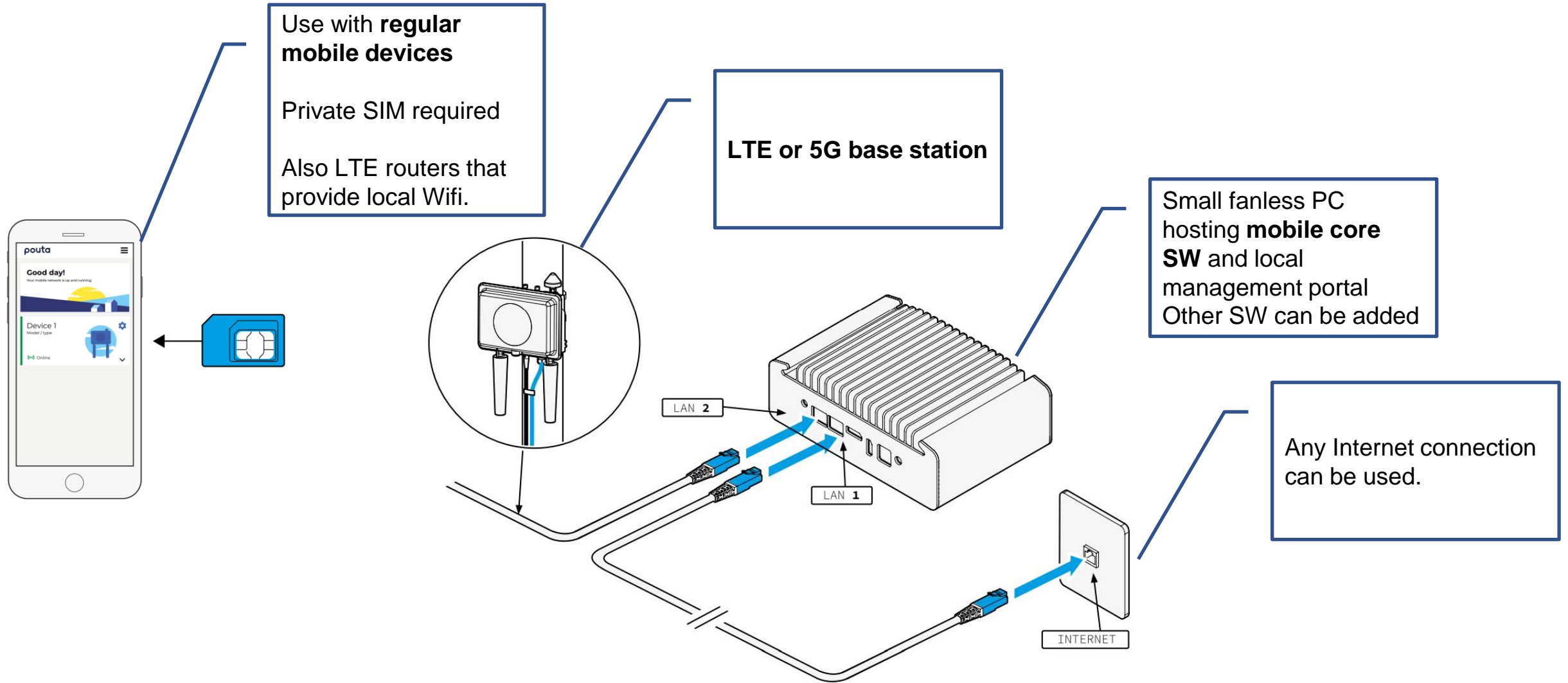
How to keep it
simple?



Build for your use cases

Requirements	Your applications/ services	Coverage	Number of users
Capacity	Uplink/downlink bitrate (max/average)	Outdoor / indoor	Simultaneous users (especially heavy users)
Service availability	Impacts of service unavailability Need for seamless mobility	Impact of coverage gaps	Users at cell edges
Additional requirements	Latency/round trip delay <i>Is a routed access network OK or is L2 needed?</i> Use of public resources?	Safety & other regulations may set additional constraints.	Types of UE, differentiation of services (fire brigade)

Use case requirements are a better starting point for design when compared to slogans and industry hype: 5G Advanced, URLLC etc.



Good luck with your
private network!

