

5G: a part of today's mega trends that has finally arrived in Belgium



Contents

1	Today: speed and connectivity; in the coming years: latency and slicing.....	3
2	50 shades of public and private networks	3
3	Have yourself a merry little 5G network.....	4
4	5G has security by design.....	4
5	Slicing and its automation and orchestration.....	4
6	5G is all about the applications	5
7	An emerging 5G ecosystem.....	5
8	Last but not least: pricing	6

About Beltug

With over 2200 members from 500+ organisations, Beltug is the largest Belgian association of CIOs & Digital Technology leaders. We cover their priorities such as vendor and software asset management, 5G, hybrid IT, cyber security, artificial intelligence, the hybrid workplace, IoT, privacy, data governance, and many more.

We defend the interests of our members, develop positions, and support knowledge exchanges between our members. Each year, we organise more than 50 events for sharing experiences. Beltug also represents the business ICT users at the European and international levels, in close cooperation with organisations in other countries.

5G: a part of today's mega trends that has finally arrived in Belgium

Highlights from the Beltug session 'From 5G indoor to 5G MEC and back', 25 Jan 2023

With the participation of four Belgian 5G operators – Citymesh, Orange, Proximus and Telenet – as well as vendors Nokia and Ericsson and regulator BIPT, this well-attended session provided a comprehensive overview of the opportunities and possibilities of 5G, today and in the near future.

The session title's hint of 'going forward' is appropriate, but while 5G may have a bright future, it is still very much a 'work in progress'. However, that shouldn't stop you from dipping your toe in the water; in fact, quite the contrary.

1 Today: speed and connectivity; in the coming years: latency and slicing

The classic benefits of new connectivity technology include enhanced broadband, ultra-low latency, and the ability to connect huge numbers of devices and machines – all over a mobile wireless network. 5G promises more throughput, with better upload/download flexibility; massive scaling; and greater reliability and quality of service, through vastly improved dedicated bandwidth. **Additional spectrum and the current roll-out of 5G RAN (radio access network) enable speed and connectivity. Once the 5G core is also rolled out, the promises of latency and slicing will be realised, but this will still take a few years.**

2 50 shades of public and private networks

These improvements are part of 5G, whether you need nationwide coverage; have a strictly isolated, 100% local and private network; or want to cover any need in between (e.g., connecting sites) using any mix of available services. They are improvements that you can enjoy outdoors, on the road, at industrial sites, or in (smart) buildings. And whether you are catering to B2C users (who consume more bandwidth with data-heavy applications, including VR/AR in the future); B2B customers (in industrial environments, for controlling mobile devices beyond line of sight, for professional media streams, etc.); or others (security, first responder services, mission critical infrastructure, etc.).

As a result, **5G uses many more segments of the electromagnetic spectrum than its predecessors, just to provide appropriate signal penetration and coverage.** This may impact the user experience; for example, a lower frequency allows better signal penetration in buildings and greater coverage, but results in lower throughput. Higher frequencies for higher throughput will require innovative in-building solutions.

3 Have yourself a merry little 5G network

At this session, regulator BIPT also pointed out the possibility of setting up small-area 'private broadband radio local area networks'. The related Royal Decree recently adopted at the Federal level and agreed by the regional level, **allows for the use of a 40MHz frequency block in the 3.8GHz-4.2GHz range, within a strictly demarcated area**. The allocation of a mobile network code/MNC requires a commercial roaming agreement with a mobile network operator. A 10-year licence can be obtained for an application fee of € 1,000 and an (index-linked) annual fee payable per km² per MHz (€ 318/km²/MHz). The legal entity/person applying for the licence must provide proof of a link with the area covered by the licence, and must justify the need for a frequency block.

In the second half of 2024, regulator BIPT plans on publishing additional technical aspects and conditions.

4 5G has security by design

One welcome improvement is more peace of mind, because 5G has actually been developed with security-by-design in mind. It eliminates several 4G security problems, including identifier and authentication issues, and finally involves the authorities: the 5G EU Toolbox for 5G security. While this increased security is not a 'cure all', it is an additional enabler in the overall cyber security effort (with a different role for the mobile operator).

How does 5G security compare to 4G in general? **4G is like a house with locks on the front and back doors, but once inside, you have access to all rooms. With 5G, you have a 'lock' on every room, built in from the start.**

5 Slicing and its automation and orchestration

One aspect in which 5G excels is flexibility, as exemplified by 'slicing'. **A network slice can be defined as an 'end-to-end virtual private service', from the end device to the application server, and over all elements in between**. This will be possible over a public, private or hybrid network.

In a slice, the appropriate service characteristics such as data speed, latency, availability, security etc. can be set. Several service-specific slices can be defined over a network, with different characteristics.

Furthermore, the quality of service can be guaranteed, meaning you can be sure you'll get it when you need it. Core network resources can be isolated and independently managed for reserved use by specific customers or applications. Eventually, this resource isolation (and availability guarantee) should also be extended to the RAN, to ensure the selection of the right network slice on demand by the user.

Today, when usually only a few network slices are needed, automation and orchestration are not yet involved. However, development is ongoing.

Slicing is yet further evidence of 5G's status as a work in progress, indeed a decadal effort (2020-2030) with a continuing series of releases. Again, this should not deter companies from considering the possibilities of 5G.

6 5G is all about the applications

The emergence of 5G is part of the flow of today's megatrends: not only the huge surge of data with AI and the cloud, but also the new digital nomads (at the edges), the masses of connected devices and systems (IoT, industrial, transport and more), and the trend towards massive automation and robotisation. In all of this, 5G can and will play a crucial role in absorbing the tsunami of data and facilitating profitable services.

Nevertheless, it is not a technology to implement for technology's sake, on the simple promise of more throughput and bandwidth. It's not simply about ripping out cables and going for better performing wireless. **All operators stress the need for solid use cases and business cases to justify starting 5G-based projects.**

5G requires a study of how to improve your processes and operations. It is really about the applications on top of 5G, rather than about 5G itself. How to transform the way you work? Does it make sense? What applications should run where (at the edges, in the cloud, etc.)? How to handle the data streams and data processing (yes, data will overtake voice in importance over 5G)? To put it bluntly, 5G is definitely not a 'one-size-fits-all' technology: it's a technology spectrum.

7 An emerging 5G ecosystem

And that means 5G is not a 'DIY project', unless you have managed to hire the still-rare 5G experts. You will have to call in advisors and support to study, develop, implement and (probably) operate your tailored 5G infrastructure. All Belgian operators already offer this advice and support, backed by the necessary test equipment, labs, frameworks and collaborative business ecosystems (start-ups, etc.). All of this is available whether you are considering projects based on private, public or hybrid networks. A demo project programme with public subsidies provides an additional push.

Operators are already jockeying for position, pointing to their expertise based on test projects and the operational networks they have built in all kinds of industries (ports, airports, industrial sites, enterprises and more). Clearly, Belgium is getting up to speed in the new world of 5G. But be aware that building more expertise will take more time, as will the rollout of public 5G infrastructure – even with operators working together to make it happen. Real B2B demand will determine much of the 'when' and 'where' of this rollout (with mixed 4G and 5G infrastructure). Also, the availability of 5G-enabled specialised devices (e.g., ruggedised industrial handhelds) will improve with time and demand.

8 Last but not least: pricing

During the roundtable discussion and Q&A, questions inevitably arose about pricing. This too is still a 'work in progress', as not all cost elements are known. But there are some hints.

If you go for a 100% full private network, you will pay solely for its construction, irrespective of data volumes.

Clearly, the future lies in paying for services. As availability, redundancy, etc., gain in importance, this will be what you pay for. Already, payment plans focusing on features, functionality and options – without reference to data volumes – are in place.

As Belgium is lagging behind the leading 5G markets, operators can benefit from lessons learned regarding changes in the use of mobile services and related changes in revenues.



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Beltug vzw/asbl

Bedrijvencentrum Waasland, Industriepark-West 75 | B - 9100 Sint-Niklaas | +32 3 780 17 30

BE 0443-557-046 | RPR Gent, afdeling Dendermonde

www.beltug.be | info@beltug.be