0 0 0 0 0 4 8 7 2 5 3 1
UKE BAK 2022-04-01 22218/2022
L.zał. 0

ERICSSON

UKE Consultations on the future development of unit 0 in band C - Ericsson Response

Dear UKE,

Ericsson Sp. z o.o. ("Ericsson") welcomes the opportunity to respond to the UKE *"Consultations on the future development of unit 0 in band C"* and follows this process with the high interest and ambition to contribute to the digitalization in Poland by sharing experiences from different markets.

Please, find below in this document our responses to the questions raised within this consultancy request.

Being a leading vendor of 5G technology, Ericsson is fully committed and open to support 5G deployment in Poland.

Martin Mellor
Prezes Zarządu
Ericsson Sp. z o.o.

Martin Mellor, Country Manager
Ericsson Sp. z o.o.

Contents

Introduction

C-Band 5G performance in terms of robustness, capacity, latency and data rate has been recognized to offer unprecedented potentials for different industry verticals and local enterprises striving for a higher level of automation and dataflow as well as lower costs.

The approach governments take will have considerable influence on whether 5G is deployed extensively and its full potential is realized. Key Ericsson recommendations in this regard are the following:

- Governments should prioritize pervasive, high quality network deployment over the goal of maximizing spectrum fees.
- Longer and clearer license terms can incentivize higher levels of investment and innovation.
- Maximizing the availability of spectrum in a timely and planned manner is critical for economic growth.
- The value of spectrum is best realized through its economic and social use.

Some countries have begun to consider licensed spectrum as part of industrial digitalization and industrial applications. Germany, for example, allocated local licensed spectrum in 3700–3800 MHz band range to industries for their applications already in 2019, while Japan similarly announced the allocation of the 28 GHz. Some nations, like Czech Republic and Denmark, have chosen an alternative way to dedicate spectrum to industries. They are offering CSPs national licenses in selected 5G bands under the obligation to offer local spectrum leasing to industries at a pre-defined price. The approaches taken differ widely between regulators, and the allocated bands are in many cases shared with incumbents.

Regarding the locally licensed spectrum considered by administrations, these diverse allocations pose challenges to building a device ecosystem for industrial applications. Device chipsets need to be supported not only by an ecosystem of traditional mobile broadband (MBB) devices but also by an ecosystem that includes industrial devices of varying complexity on different spectrum bands. These ecosystems, however, are still under formation. In the table below, a snapshot can be found of the spectrum allocations and regulatory discussions on assignment of spectrum dedicated for industrial applications as of March 2022.

Country	Spectrum (MHz)	LTE/ NR band	Mode of operation	Bandwidth	Comments
Brazil	3700-3800	B43/ n78	TDD	100MHz	Considering allocation
Croatia	3400-3480	n78	TDD	80MHz	Allocation in 2021 with a local licensing/ leasing option
Czech Republic	3400-3480 3640-3700	B42/ B43/ n78	TDD	2*20MHz	Allocated in 2020 to two CSPs with a leasing option
Denmark	3740-3800	B43/ n78	TDD	60MHz	Allocated in 2021 to CSPs with a leasing option
Finland	2300-2320 3410-3800	B40 B42/ B43/ n78	TDD	20MHz TBD	Available 2020 Allocated in 2018 to CSPs with a leasing option
France	2575-2615 3490-3800	B38 B42/ B43/ n78	TDD	40MHz 4x50MHz	Available 2019

					Allocated in 2020 to four CSPs with a leasing option
Germany	3700-3800	B43/ n78	TDD	100MHz	Available 2019
Greece	3410-3800	B42/B43/n78	TDD	TBD	Allocated in 2021 to CSPs with a leasing possibility
Japan	2575-2595 4600-4900	B41 n79	TDD	20MHz 300MHz	Available 2019 Available 2020
Netherlands	3410-3450 3750-3800	B42/ B43/ n78	TDD	40MHz + 50MHz	Available with restrictions. New regulations in 2023
Norway	3400-3800	B42/ B43/ n78	TDD	TBD	Allocated in 2021 to CSPs with a leasing option
Poland	3410-3470	B42/ n78	TDD	70MHz	Considering allocation
Sweden	3720-3800	B43/ n78	TDD	40MHz	Available in 2021
UK	1781.7-1785/ 1876.7-1880, 2390-2400, 3800-4200	B3, B40, n77	FDD + TDD	3+3MHz 10MHz 400MHz	Available 2019
US	3550-3700	B48/ n48	TDD	<150MHz	Available 2020

Entities authorized to obtain a reservation

Question 1: Should frequency reservations from block 0 be allocated only to entities running regional activities (e.g. covering the area of municipalities included in no more than four provinces) or local (e.g. in the area of a given municipality or municipalities, not larger than the area of a given county) ie local governments, entrepreneurs running local activities, excluding entities with nationwide frequency licenses?

Harmonizing the use of spectrum bands across geographies is essential to achieving mass-market conditions which in turn enables cost-efficient and competitive industrial devices. Many countries have already begun to assign spectrum for 5G wide-area cellular networks, and quick regulatory actions and decisions have proven to be highly positive for all ecosystem parties, benefiting service providers and device makers with the ability to make technology investments as well as consumers with the possibility for earlier enjoyment of new generations of technology.

Regulators and policy makers have a different set of challenges. In countries that have decided (or are planning to decide) on locally licensed industry spectrum, regulators and policymakers must find an easy to understand and cost-efficient model for its regulation. If implementing locally licensed spectrum for industry purposes, they must ensure that its utilization is efficient. Additionally, it is important to note that the way in which licensed spectrum is managed within countries also impacts the appeal of the 3GPP path. When licensed spectrum is offered locally with the objective of satisfying the needs of industries, a few basic requirements should be fulfilled as to how this is offered.

These requirements include that:

- Access to spectrum must be predictable over a long period of time to support uninterrupted operation and major investments in production processes and industrial facilities having a lifecycle of typically 15–20 years.
- Schemes awarding excessive first-mover advantages should be avoided so that industries or other players do not block spectrum through spectrum hoarding.
- Local spectrum not yet licensed to industries should be kept available to increase spectrum utilization efficiency for spectrum license holders (such as CSPs), though with a sufficient safety margin to ensure that existing local networks are not subject to interference.
- It should be noted that radio network providers and device makers can potentially face challenges with developing solutions for unique frequency bands unless the availability of devices and an ecosystem are factored into the decision of dedicating frequencies for locally licensed spectrum.

Offering long term licensed spectrum on regional or local level can open up for licensing contradicting to the purpose of making scarce spectrum available for the good of society. These side effects include:

- Geographic cherry-picking, offering local coverage only but no coverage in less attractive areas. This constitutes the opposite to the coverage requirements as frequently used in Nation Wide Licensing to secure coverage in areas that are less commercially attractive.
- Spectrum Hoarding or speculations in spectrum holdings, where services are never offered unless the license is eventually bought by, and transferred to, an MNO. "Use it or lose it" regulations may be applied but has proven difficult and time-consuming to enforce.

- Fragmentation of spectrum leading to less efficient use of valuable spectrum, as "1+1 >2" when it comes to bandwidth.

Allocating licensed spectrum for wide-area services to a limited number of CSPs has proven successful and cost-efficient through the well-functioning market and competitive services it has generated for consumers, with 3GPP network coverage serving roughly 95 percent of the world's population. Wide area spectrum for industries would lead to the underutilization and fragmentation of spectrum and thus the loss of its efficiency. As for locally licensed spectrum, the situation is different, as deployments are typically made on private property and frequently indoors, where the availability of competing indoor offerings is not naturally secured.

If countries decide to dedicate locally licensed spectrum, an idea defined as the "real estate principle" should be the preferred principle to apply when doing so. In short, this refers to linking a priority right to acquire a local license to the real estate ownership (or tenant, depending on national prerequisites). This simple principle meets the three requirements mentioned earlier of having predictable spectrum access, avoiding rewarding first movers, and ensuring availability of unused local spectrum. The real estate principle offers predictable access to spectrum over time as well as a sustained possibility for late entrants to acquire local spectrum and still leaves unused spectrum available for short- or medium-term use by third parties.

Some additional examples of the benefits associated with the real estate ownership principle include that the legal principles surrounding real estate are established, well defined and understood, and digitized in most if not all countries. The logical connection needed in order to be able to dispose of spectrum on owned property is also easily understood and fits the need for local high-performance systems. Leasing of locally licensed spectrum should be allowed to ensure access to spectrum in all scenarios.

Spectrum not yet claimed by the real estate owner can also be offered to CSPs and third parties for a limited time (for example, for sports events or concerts where temporarily increased coverage or capacity is needed), but only as long as sufficient safety margins are kept to fully guarantee existing local licenses are not interfered with.

The European Commission mandated CEPT to study harmonization of the 3.8–4.2 GHz band for low- and medium-power applications on a local basis.

Below you will find extract of selected countries approaches to frequency allocations and entities authorized to obtain reservations. For the purpose of response Ericsson decided to compare United Kingdom, Germany, Sweden and Denmark which we believe gives UKE a view on the wide spectrum of different approaches towards Block 0.

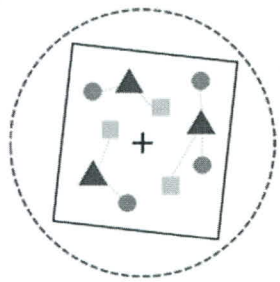
UK (Ofcom)

There are two kinds of Shared Access licenses: low power and medium power.

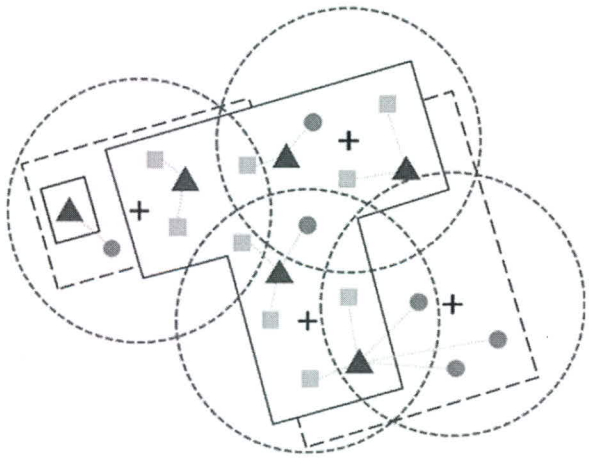
Low power licenses can be suitable for industrial and enterprise users looking to deploy their own private networks. It intends to support voice and text applications or other wireless data applications around the sites.

Medium power licenses for users who need a longer transmission range from their base station, but don't expect to need to change the locations of base stations once they're deployed. This could suit providers of Fixed Wireless Access (FWA) services in rural areas, along with industrial or enterprise users with sites spread over a larger area, such as ports, agriculture, or forestry.

Examples of low power Shared Access license use



Simple deployment with one registered low power licence area. Licensee has opted for an indoor-only licence as they do not anticipate needing to deploy base station equipment outdoors.



More complex deployment with four areas licensed in order to give the user the flexibility to move base stations anywhere on their premises, which is made up of one large T-shaped building, an outbuilding on the left of the image, and two outdoor yard areas on the left and right. Licensee intends to install base stations in the yards, so has chosen licences valid for both indoor and outdoor use.

Legend

- + Registered location
- ---- 50m radius from registered location
- —— Wall of building
- – – · Perimeter of outdoor yard area
- ▲ Base station
- ■ Fixed/installed terminal
- ● Mobile/nomadic terminal
- ····· Base station/terminal connection

Selected geographic areas are excluded from possibility to apply for the license. For example, Ofcom does not initially accept applications:

- within 5km from selected military type objects for frequency of 3.8GHz – 4.2GHz,
- for outdoor coverage in 2.3GHz frequency

- for medium power at non-rural areas

On top Ofcom does mention that Users looking to provide wide-area coverage should look for spectrum in other bands than 3.8GHz – 4.2 GHz.

GERMANY (Bundesnetzagentur)

In addition to the nationwide spectrum usage rights in the 3400-3700 MHz bands, the Bundesnetzagentur is making further spectrum in the 3700-3800 MHz band available for local assignments. The objective is to ensure that applicants can be awarded local assignments on a flexible and needs-oriented basis. Account is also taken in particular of the fact that some business models require spectrum for separate, autonomous telecommunications networks.

It will be possible to use this spectrum for industrial automation/industry 4.0, but also for agriculture and forestry. Eligibility to apply can ensue from a premises ownership right or another right to use premises (such as a lease), or from relevant authorization by the holder of such a right. The applications will therefore generally be in-house applications.

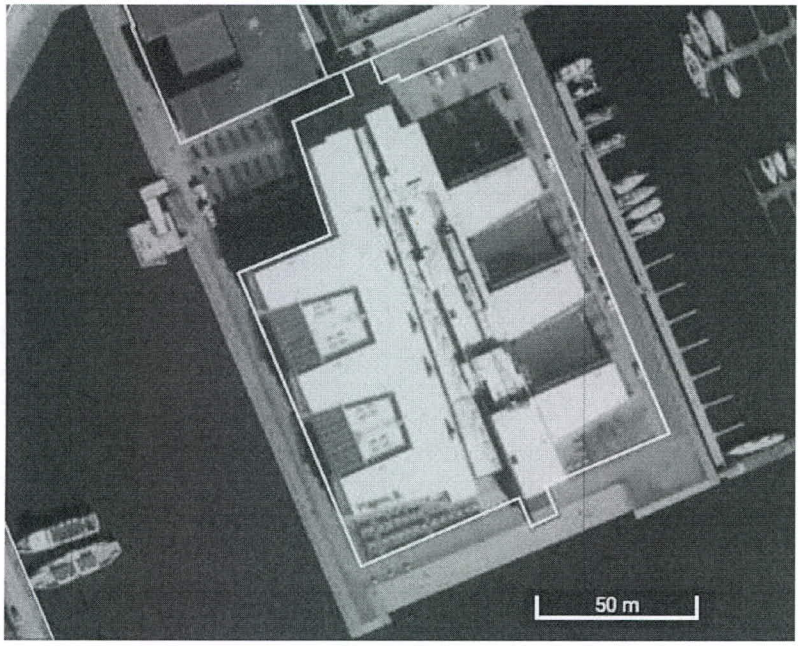
The Bundesnetzagentur reserves the right to review the framework conditions for the 3700-3800 MHz band one year after the application process has begun, with a view to ensuring efficient and interference-free spectrum use. The Bundesnetzagentur will also take into account the possibility for holders of nationwide assignments at 3400-3700 MHz to use unused spectrum above 3700 MHz as temporary additional capacity.

Applications can be made for local spectrum usages, including in particular assignments for business/ commercial/ industrial premises. Premises are also taken to mean a section of the surface of the Earth that forms a unit because of the nature of its economic use or its external appearance, even if it comprises more than one plot in real estate terms. This definition therefore covers, for example, industrial parks and exhibition venues as well as agricultural and forestry land.

this context, it is also conceivable for several owners of premises, for example in an industrial park, to make a joint application for spectrum assignment for the whole area.

SWEDEN (PST)

Sweden has made local licenses available in the frequency range 3.72 – 3.8 GHz. A local license is granted for a geographically connected area within or part of a property that corresponds to the immediate area within which the applicant intends to build the network (the permit area). Below is a property (overlaid a satellite image) defining an existing local license, based on publicly available data from the Swedish mapping, cadastral and land registration authority (Lantmäteriet). The image was taken directly from the Internet.

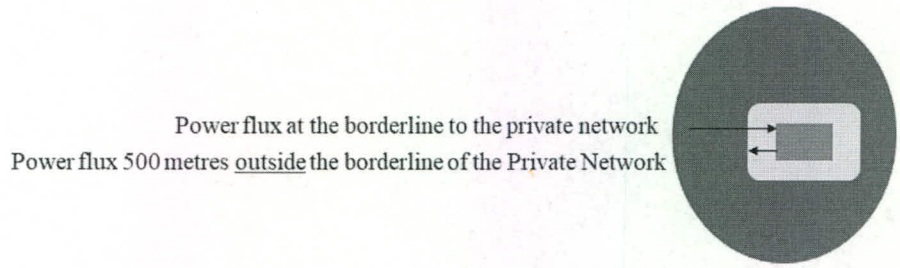


Unlike Germany, the applicant does not need to have a connection to the property. Applying leasing to local licenses is not seen as a problem, since leasing regulation exist in Sweden.

DENMARK (DEA)

The 3,5 GHz band was auctioned to CSPs spring of 2021. Until 31 May 2025 the licensee shall meet requests for lease of frequencies in band 3.74GHz – 3.8GHz .

The Lessee shall ensure that the accumulated power flux density (PFD) from the Lessee's Private Network at a distance of 500 meters outside the borderline of the Private Network, shall not exceed -5 dBm/m2/(5 MHz) at a height of 1.5 meters.



The interference definition is asymmetrical, giving the Private Network some extra space. The lease is paid for the green and the yellow area.

Block width

Question 2: What should be the minimum width of the frequency block allocated in the reservation? Should frequency reservations from block 0 cover the full 70 MHz, or should block 0 be divided into smaller blocks, e.g. 30 and 40 MHz or 20 MHz, 20 MHz and 30 MHz? Alternatively, are the frequencies to be assigned otherwise in multiples of 5 MHz, and if so, in what values?

Strategies taken by different countries for frequency blocks allocations:

UK	10, 20, 30, 40, 50, 60, 80 and 100 MHz (for 3.8GHz – 4.2GHz)
GERMANY	multiples of 10 MHz
SWEDEN	multiples of 10 MHz
DENMARK	not specified

Question 3: Should there be a limit to the amount of spectrum that one entity can obtain?

UK	NO RESTRICTION
GERMANY	NO RESTRICTION
SWEDEN	NO RESTRICTION
DENMARK	NOT APPLICABLE

Reservation area

Question 4: Should frequency reservations in block 0 cover the areas of individual communes, poviats or voivodships?

UK, GERMANY, SWEDEN and DENMARK all regulate non-public services. So far, none of the countries considers frequency allocations based on administrative division. Frequency allocation is in most cases attached to the property ownership or right to use.

Question 5: Should UKE define the reservation areas in advance by indicating the communes that will be part of a given area?

UK, GERMANY, SWEDEN and DENMARK all regulate non-public services. So far, none of the countries considers frequency allocations based on administrative division.

Start using frequencies

Questions 6: When will it be possible for you to start providing services based on frequencies from block 0?

UK

User with granted license has to start transmitting within six months of being issued the license and continue to remain operational after this. It is allowed to switch the equipment off from time to time (e.g. for maintenance). Regulatory purpose of this condition is more about making sure that licensees who've stopped transmitting for good aren't blocking access to spectrum for new users due to the first come, first served principle.

GERMANY

The Bundesnetzagentur must be notified of the beginning and end of use. The same applies to plans for transferring or leasing spectrum. The Bundesnetzagentur would specifically like to draw attention to section 102 TKG. This states that a spectrum assignment can be revoked if use of the spectrum has not begun within one year of the assignment, or if the spectrum has not been used for the purpose for which it has been assigned for more than one year (use it or lose it procedure).

SWEDEN

The permit conditions include a requirement for commissioning within six months. This condition applies to each separate permit.

DENMARK

The Lessee shall start using the Frequencies within two years from the date of entering into the Contract.

Liability

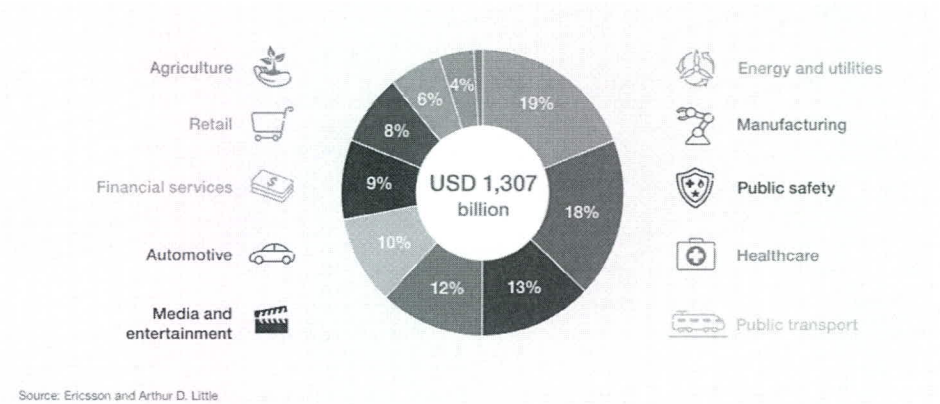
Question 7: Should the frequency in block 0 be allocated through selection procedures, should the coverage, quality or investment obligations be specified?

In UK, GER, SWE and DEN we did not identified coverage, quality or investment obligations factors impacting possibility to obtain the license. Obligations relate to maximum period for launching the services – details described in the answer to Questions 6.

Use of frequencies

Question 8: For what applications do you intend to use the frequencies in block 0?

5G will create an ecosystem for technical and business innovation involving vertical markets and highlights the opportunities for service providers across 10 key industries: manufacturing, automotive, energy and utilities, public safety, healthcare, media and entertainment, public transport, financial services, retail and agriculture. Industry digitalization investments will generate an estimated USD 1.307 billion revenue opportunity for telecom service providers by 2026. Telecom service providers can profit from an additional 36 percent revenue potential by 2026 from 5G-enabled market opportunities



5G-enabled industry digitalization revenues for ICT players, 2026

In our recently released report, Network slicing: Top 10 use cases to target, Ericsson and Arthur D. Little analyzed more than 70 external market reports about the global digitalization of industries and also reviewed more than 400 digital use cases from 70 industries and took a deeper look into one or two use cases in each industry.

Manufacturing. The production segment will see strong growth of 36 percent compound annual growth rate (CAGR) from 2025 to 2030. The manufacturing production segment consists of several players that are focused on the preparation, processing and fabrication of goods from raw materials. A key growth driver is the rapid technological adoption and demand for mass customization. Consumers and enterprises want more personalized production of goods, which adds additional value and creates a larger addressable market. Key use cases include augmented reality (AR) devices that will enable improved quality inspection and diagnosis for maintenance workers, technicians and service providers throughout a plant, as well as remote controlled robots and 3D video-driven interaction between collaborative robots and humans. With a network that can guarantee the level of throughput, reliability and control required through quality of service (QoS), for example collaborative robots.

Broadcasting and streaming. This is a fast-growing industry. Consumer spending on ultra-high definition (UHD), virtual reality and 360-degree video is expected to grow at a 35 percent CAGR through 2023. The ways in which people produce, distribute and consume entertainment content is rapidly changing. There are a number of near-term uses cases in the industry that 5G SA network can enable, such as, remote broadcast and production. For example, 5G SA network would enable most of the personnel involved in the live broadcast of an event control cameras, mix and edit content and change views on the fly, even if they are working from a location hundreds or thousands of miles away from the event. This is because the ultra-low latency of a network slice combined with its quality of

service, can provide the required reliability and throughput to enable real-time control of cameras. Since CSPs can deploy slices globally at a predictable cost, broadcasters can now produce niche events that were not previously economically viable. 5G will provide better coverage than fixed solutions, and a network slices ability to isolate traffic could be configured to meet the broadcaster's specific security needs.

Many enterprises have the ambition for new innovative connectivity solutions but face complex challenges when integrating these into their operation. Therefore it is important to raise awareness about an already existing ecosystem that gives enterprises and CSPs access to partners who can help raise productivity by combining 4G or 5G cellular connectivity with innovative devices to connect to the network, software to manage processes, and system integrators to bring it all together. Ericsson has a partner program with a focus on enabling and accelerating the Industry 4.0 ecosystem:

- Device & Hardware
- Software & applications
- Professional Services

The most notable new verticals solutions and deployment scenarios addressed in 3GPP Releases 16 and 17 of 5G New Radio (NR) are in the areas of:

- Integrated access and backhaul (IAB)
- Features related to Industrial Internet of Things (IIoT) and ultra-reliable low latency communication (URLLC)
- Intelligent transportation systems (ITS) and vehicle-to-anything (V2X) communications
- Positioning

Integrated access and backhauling IAB. Provides an alternative to fiber backhaul by extending NR to support wireless backhaul. As a result, it is possible to use NR for a wireless link from central locations to distributed cell sites and between cell sites. This can simplify the deployment of small cells, for example, and be useful for temporary deployments for special events or emergency situations. IAB can be used in any frequency band in which NR can operate. However, it is anticipated that mm-wave spectrum will be the most relevant spectrum for the backhaul link. Furthermore, the access link may either operate in the same frequency band as the backhaul link (known as inband operation) or by using a separate frequency band (out-of-band operation).

Industrial IoT and ultra-reliable low-latency communication. The IIOT is a major vertical focus area for NR release 16. To widen the set of potential IIoT use cases and support increased demand for new use cases such as factory automation, electrical power distribution and the transport industry, release 16 includes latency and reliability enhancements that build on the already very low air-interface latency and high reliability provided by release 15. Support for time-sensitive networking (TSN), where very accurate time synchronization is essential, is also introduced. Figure below illustrates TSN integration in 5G NR.

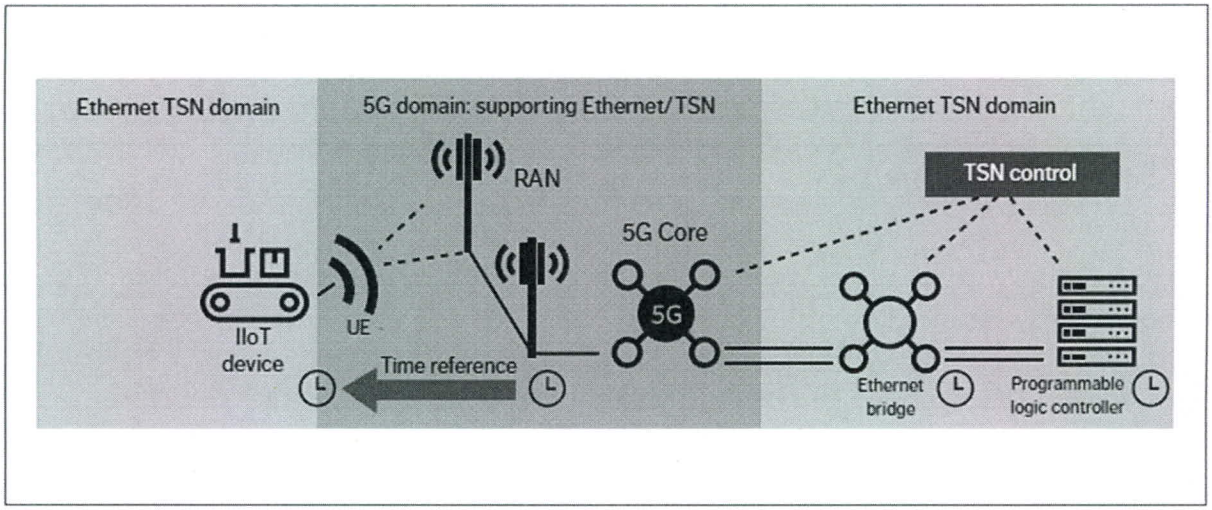


Figure 3 Overview of the TSN integration

The overview of time-sensitive integration

Although many of the URLLC-related improvements are small in themselves, taken together they significantly enhance NR in the area of URLLC. The inter-UE downlink (DL) preemption that is already supported in release 15 is extended in release 16 to include the UL, such that a UE's previously scheduled lower-priority UL transmission can be preempted (that is, cancelled) by another UE's higher-priority UL transmission. Release 16 also supports standardized handling of intra-EU UL resource conflicts.

To reduce latency, release 16 supports more frequent control-channel monitoring. Furthermore, for both UL configured grant and DL semi-persistent scheduling, multiple configurations can be active simultaneously to support multiple services. These enhancements are especially useful in combination with TSN traffic, where the traffic pattern is known to the base station.

Intelligent transportation systems and vehicle-to-anything communications. ITS, which provide a range of transport and traffic-management services, are another major vertical focus area in release 16. Among other benefits, ITS solutions improve traffic safety as well as reducing traff c congestion, fuel consumption and environmental impacts. To facilitate ITS, communication is required not only between vehicles and the fixed infrastructure but also between vehicles. Currently, 25 use cases for advanced V2X communications have been defined, including vehicle platooning and cooperative communication using extended sensors. In release 15, communication with fixed infrastructure is provided by the access-link interface between the base station and the UE.

Release 16 adds the option of the NR sidelink (PC5), which can operate in in-coverage, out-of-coverage and partial-coverage scenarios, utilizing all NR frequency bands. It supports unicast, groupcast and broadcast communication, and hybrid automatic repeat request (hybrid-ARQ) retransmissions can be used for scenarios that require more robust communication. Groups can be either configured or formed, and the group members communicate using groupcast transmissions. A truck platoon, for example, could be configured using dedicated hybrid-ARQ signaling between the receivers and transmitter, or formed in a dynamic manner based on the distance between the transmitter and receiver(s).

Positioning. For many years, UE positioning has been accomplished with Global Navigation Satellite Systems assisted by cellular networks. This approach provides accurate positioning but is typically

limited to outdoor areas with satellite visibility. There is currently a range of applications that requires accurate positioning not only outdoors but also indoors. Architecture-wise, NR positioning is based on the use of a location server, similar to LTE. The location server collects and distributes information related to positioning (UE capabilities, assistance data, measurements, position estimates and so on) to the other entities involved in the positioning procedures. A range of positioning methods, both DL-based and UL-based, are used separately or in combination to meet the accuracy requirements for different scenarios.
As industrial digitalization accelerates, so does the demand for the advanced connectivity that private cellular networks can deliver and that liberates industrial enterprises to unlock the potential of automation, control, and exponential growth.

Manufacturing, ports, airports, oil & gas, mining and energy plants are some enterprise sectors enabling innovative new use cases with a private cellular network. A private cellular network is an on-premise network deployed for an enterprise's exclusive use and unique requirements.
The main benefits of Private Networks

- Guaranteed coverage is the most apparent benefit. It is assured in the enterprise's operations area, both indoors and outdoors as required, through a dedicated spectrum, even in remote locations, such as in mining or offshore oil rigs.
- Security and encryption are vital and of the strongest standards since Private Networks are based on cellular technology. This offers high levels of security as 3GPP standards are closely adhered to across vendors, and the private nature of this solution ensures that all data stays on-premises.
- Ensured capacity is an essential feature, as a private network removes any contention with other network users, making it possible to guarantee network performance, such as uplink and downlink bit rates and latency.
- Retained control due to Private Networks enabling enterprises to determine and control how resources are utilized, and how traffic is prioritized, is a further advantage
- Critical reliability is assured as private networks are based on LTE/5G technology, which offers performance and enables applications that cannot be accommodated by Wi-Fi, such as mission-critical communication services and ultra-high definition video surveillance.
- Predictable and ensured low latency is another important feature. It is a requirement for many IoT applications that rely on timebound communications, where delays can result in a catastrophic failure, such as for critical control of remote devices like heavy machinery.
- High data speeds for communication compared to narrowband Land Mobile Radio systems, which suffer from capacity restraints, are also offered. This is ideal for video and high-resolution imagery, desirable in many industry segments.

Ericsson cooperation with Industry in Poland

As part of efforts on the industrial private wireless front, Ericsson decided to start working directly with polish industry sector, with first 5G Knowledge Transfers delivered to UKE in late 2018 and to Lodz Special Economic Zone in early 2019. The result of knowledge transfers was launch of S5 – 5G Accelerator Program where 20+ 5G use cases were developed and implemented in cooperation with five industrial partners. Use case types: AGV, 360 Camera live stream to VR 360, VR Training, Predictive Maintenance, edge equipment and others. Program ended with first 5G Summit in 2021. Within two years Ericsson delivered to large, medium and small enterprises over 4 000 hours of knowledge transfer and consultancies with help of local Ericsson trainers and research and development engineers from Lodz and Cracow. In parallel together with Institute of Communications, Lodz Polytechnics and FundingBox Ericsson created Digital Innovation Hub 5G and delivered first 5G Campus Network in Poland, located at Lodz Polytechnics. All infrastructure related KPIs were met. On top, DIG 5G infrastructure was used to deliver first 5G Pilot for PKN Orlen.

Ericsson plans further activities related to popularization of 5G technology in the Industry sector in Poland. With over 2000 R&D engineers in both domain RAN and CORE and 5G radio and baseband delivered to Ericsson from Poland Ericsson has all competences available locally for enabling industries to benefit from 5G technology. Establishing cooperation between CSPs and industry with be extremely important to be able to maintain highest SLA levels needed in the path to full digitalization and for the most demanding use cases.

Question 9: Can or should frequency reservations in block 0 be granted on a shared basis?

In GERMANY applications can be made for local spectrum usages, including in particular assignments for business/ commercial/ industrial premises. Premises are also taken to mean a section of the surface of the Earth that forms a unit because of the nature of its economic use or its external appearance, even if it comprises more than one plot in real estate terms. This definition therefore covers, for example, industrial parks and exhibition venues as well as agricultural and forestry land.

Eligibility to apply can ensue from a premises ownership right or another right to use premises (such as a lease), or from relevant authorization by the holder of such a right. In this context, it is also conceivable for several owners of premises, for example in an industrial park, to make a joint application for spectrum assignment for the whole area.

From the other perspective, having in mind situation in Poland and the fact that there are incumbents in Block 0 it seems natural that frequency reservations should be granted on a shared basis in this geographical areas but If the licenses are granted on property ownership basis no share of spectrum is needed.

Question 10: Should the frequencies from block 0 be used not on the basis of frequency reservations, but on the basis of radio permits, on the basis of shared use?

Ericsson is not able to provide comments here while this question is rather relevant for the entities who plan to apply for the block 0 in the future.