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Standardization Leadership

3GPP Release 18

January 2025



Introduction

3GPP is continuously evolving mobile systems to enable new and enhance existing use cases. The Release 18 specifications were functionally frozen in December 2023.

3GPP Release 18 extends 5G to cover new use cases, such as AI/ML for RAN and Extended Reality (XR) and provides new features and functional enhancements for already supported use cases.

The open, consensus-based standards development process in 3GPP enables the best technology to emerge. It generates the best products technologically, provides greater security, and ensures global interoperability. The leadership in the open standardization process also serves as one of the strongest objective indications of technology leadership for the evolution of 5G and beyond.

In this report, we analyze the standardization leadership of 3GPP Release 18.



3GPP structure

There are three technical specification groups (TSGs) in 3GPP: Radio Access Network (RAN), Core Network and Terminals (CT), and Service and System Aspects (SA). The actual technical specification process is performed in working groups (WGs) under TSGs. Currently, there are a total of 15 working groups, as shown in figure 1.

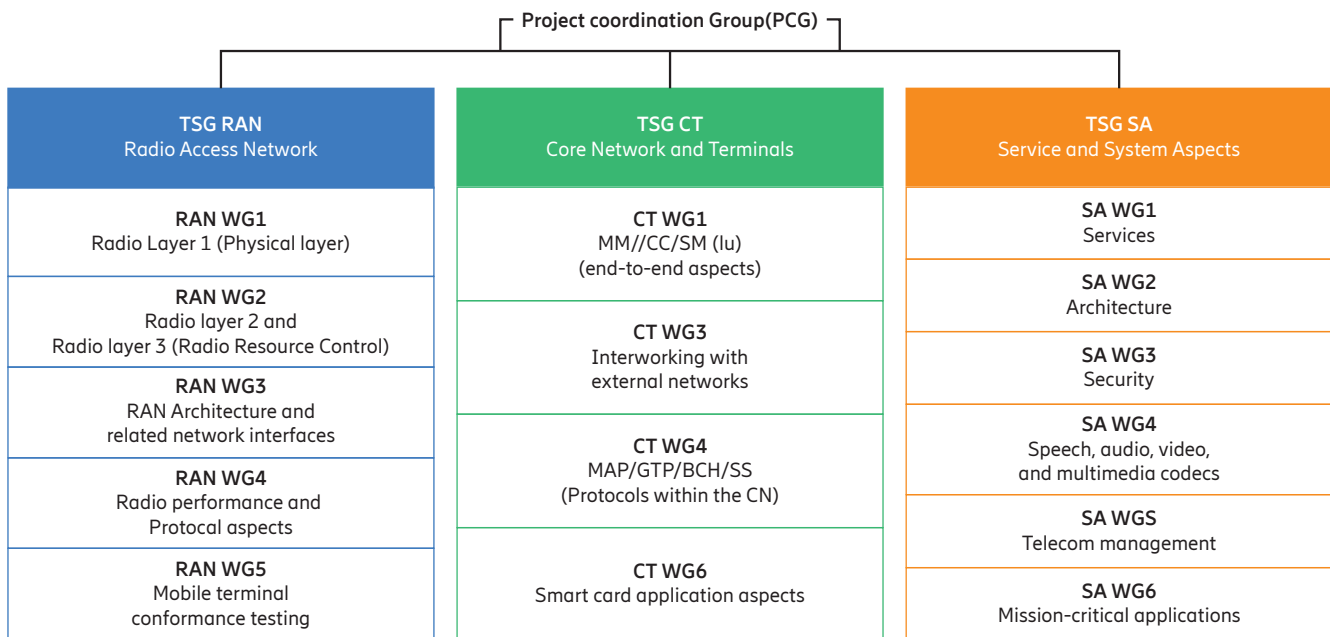


Figure 1: 3GPP Technical specification group structure

For 3GPP RAN, WG1 and WG2 specify the most important technologies for 5G air interface, providing the foundation for new technologies required by handsets, devices, and radio network infrastructure. For the core network, the main 3GPP working groups are SA WG2 and CT WG1, WG3, and WG4. In addition, the work done in security (SA3) and media (SA4) are valid for both radio and core networks.



Release 18 – the start of 5G Advanced

3GPP Release 18 marks the start of 5G Advanced and builds on the 5G baseline defined by 3GPP in Releases 15, 16, and 17.

Initial learnings have been derived from commercial 5G networks that have been deployed in large parts of the world. In addition to this, the need for the continuous evolution of 5G networks by supporting new market segments and use cases has prompted 3GPP to begin standardization related to 5G Advanced systems. 5G Advanced also provides steppingstones in areas that will be of importance in the future 6G systems.

5G Advanced will enhance network performance and add support for new applications and use cases. It is expected to bring significant enhancements in terms of:

- 5G performance
- Support for new services and applications
- Sustainable networks
- Intelligent network automation

Support for advanced antenna systems and MIMO is part of 5G's DNA. In Release 18, MIMO capacity is boosted in both the uplink and downlink. To improve the support for high data rates to mobile users the MIMO beamforming framework is improved to cater for switching between different beamforming methods depending on the user's speed.

Mobility, like MIMO, is a key component of 5G. In 5G Advanced, it has been observed that there is room to improve the service continuity for mobile users. The new L1/L2 triggered mobility (LTM) handover procedure will shorten the handover interrupt time. LTM merges the beam managing framework with the mobility framework and introduces a low-latency mobility

procedure for NR, supporting Carrier Aggregation (CA) and is applicable to both FR1 and FR2.

New use cases such as eXtended Reality (XR) demand further optimization of the 5G system. In Release 18, the performance of XR services is facilitated by 5GC support for application rate adaption using the low latency, low loss, scalable throughput (L4S) feature. XR application information regarding packet periodicity, jitter, size, and latency requirement will also be signalled from the 5GC to the RAN to make the RAN XR aware and allow XR-specific traffic handling for improving power efficiency, latency, and capacity.

From the start, 5G was designed to meet increasing traffic demands while limiting the power consumption of mobile networks. With 5G Advanced, the focus on network energy savings is further pronounced. Release 18 resulted in support for features adapting the NR operation in time, frequency, and spatial domains to make efficient use of energy. Adapting the active antenna size according to the radio propagation conditions is an example of a Release 18 feature for saving power in Massive MIMO radios.

5G Advanced provides enhancements to support intelligent network automation including RAN management, analytics, and AI/ML model life-cycle management. 5G Advanced also supports intent-based management for simplifying network management. Furthermore, Release 18 supports AI-powered network energy savings, load balancing, and mobility optimizations.

Further enhancement of the 5G Advanced system is now worked on in the recently started Release 19. To learn more about 3GPP Release 18 and 19 please access our latest white paper on 5G Advanced and its evolution towards 6G [\[1\]](#).

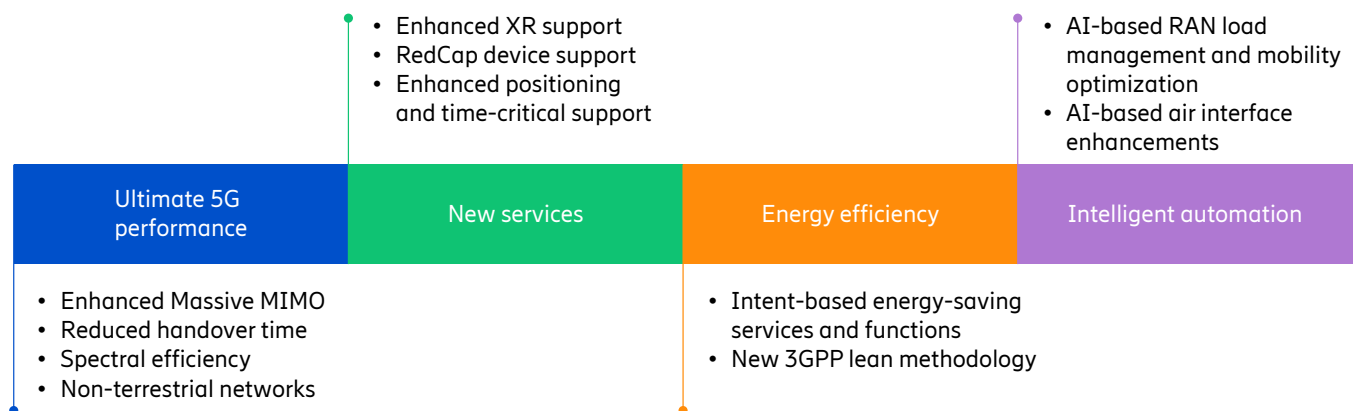


Figure 2: 5G Advanced to cover new use cases and enhanced support for existing use cases over different 3GPP releases

1. <https://www.ericsson.com/en/reports-and-papers/white-papers/5g-advanced-evolution-towards-6g>

Standardization leadership in 3GPP Release 18

Similar to earlier releases, we mostly evaluate the 3GPP standardization leadership separately for 3GPP RAN and Core network groups as different companies focus on different 3GPP working groups depending on the impact of the working groups on their business. However, as explained in the metric definition,

for chair positions it is beneficial to use as many working groups as possible. For this reason, we show the total share of working group chair positions during Rel-18 standardization for selected companies in Figure 3 below.

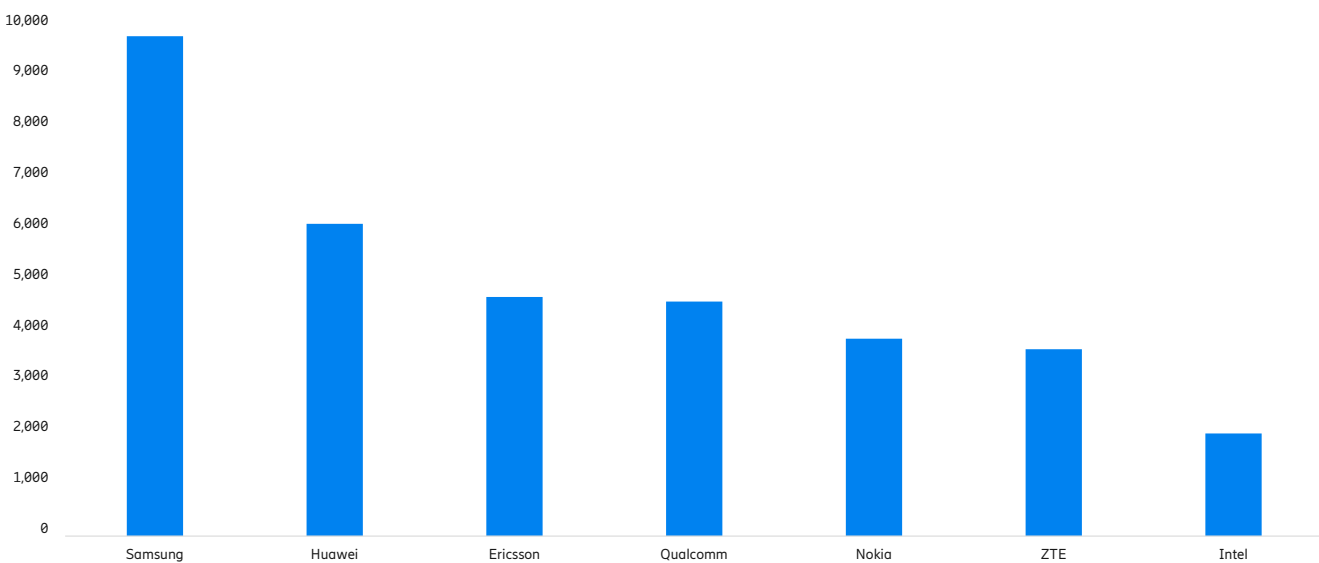


Figure 3: Leadership positions (measured in chair-days) during Rel-18 standardization for selected companies

In this report, we'll analyze the standardization leadership using a combination of four metrics. These metrics are:

1. The number of approved contributions. This metric identifies on a high level how many proposals are accepted from a company. There is a strong correlation between this metric and influence in working groups that primarily work with formal documents (especially CT and SA groups in core network areas), and even though this correlation is weaker in groups working primarily with discussion documents (especially in RAN WG1), the metric can still be used in those groups as well. It does not differentiate between major contributions, such as introducing new features, and minor corrections.
2. Specification impact. Weighting the contributions based on the impact they have on specifications allows for differentiation between major contributions and minor corrections. In this report, we have chosen to measure the impact by the amount of text added to specifications for simplicity. Even though minor corrections can be important and long corrections less important, in general, the impact of a correction can be expected to correlate with its length.
3. Quality. The quality of the contributions can be measured by examining the ratio of approved contributions to total contributions. We always use all available working groups when evaluating this metric, as this measure is less accurate in groups working primarily with discussion documents (especially in RAN WG1).
4. Leadership positions. This is an indication of trust in a company's fairness and commitment to 3GPP, especially for positions that are elected by members. In this report, we measure this by counting the number of chair-days for chair and vice-chair positions (in other words, the count of the chair and vice-chair positions for each day summed over the total measurement period). Due to the small number of chair and vice-chair positions, it is necessary to use the longest time periods and as many working groups as possible. We do not think it is possible to evaluate this metric using only one or even two working groups, and always use all available working groups when evaluating this metric.

Leadership in 5G radio access technologies

In 3GPP, RAN WG1 and WG2 define the most central technologies for the air interface, providing the foundation for new technologies required by handsets, devices, and radio infrastructure. RAN WG3 defines the architecture and protocols for Radio Access Network, while RAN WG4 defines core and performance requirements. We evaluate the standardization leadership in Release 18 for both RAN WG1 and WG2 and for RAN WG1, WG2, WG3 and WG4 as these will give a good indication of a company's strength in defining Release 18 enhancements to the 5G air interface and overall 5G radio access.

In Figure 4, we provide the evaluation of the standardization leadership in 3GPP RAN for Release 18 NR contributions from the beginning of Release 18 (January 2022) up to the functional freeze of Release 18 (December 2023). The values for the metrics have been normalized to the leader to create comparable values between zero and one.

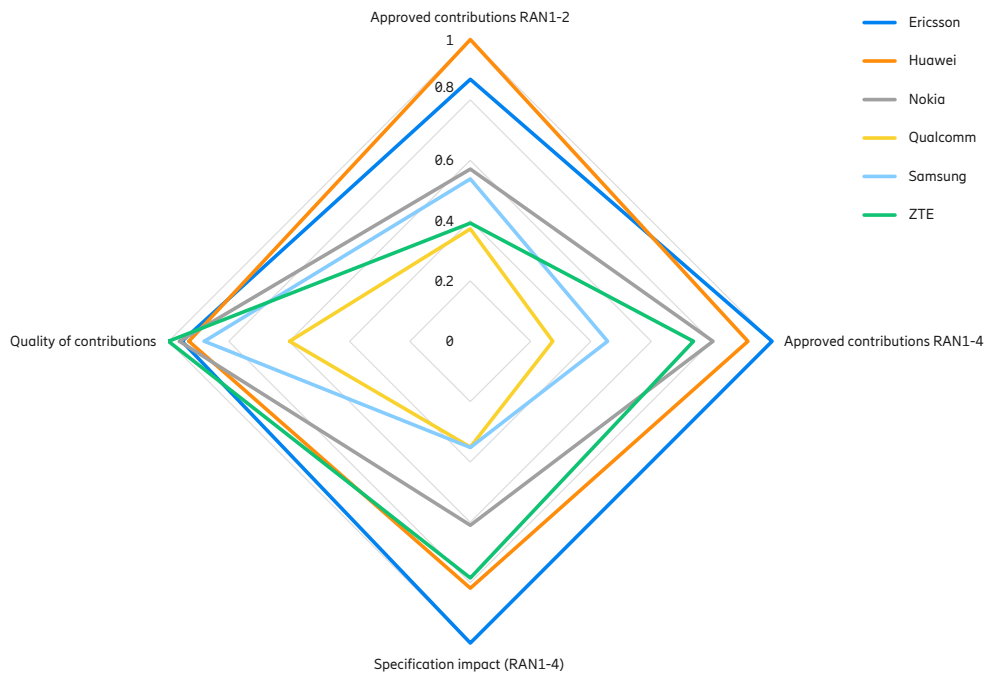


Figure 4: Evaluation of standardization leadership in 3GPP RAN

Given the importance of driving the overall Radio Network evolution for Ericsson business, we also provide a detailed evaluation of RAN WG1, WG2, WG3 and WG4 below.

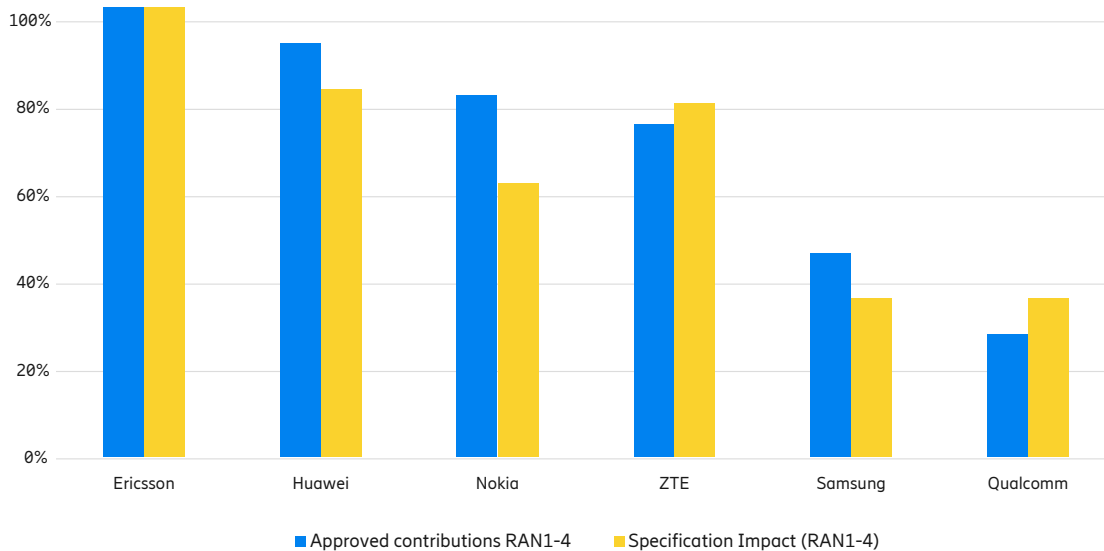


Figure 5: Evaluation of standardization leadership in 3GPP RAN WGs 1-4 using relative share of approved contributions and relative share of specification impact

Leadership in core network protocol standardization

The main 3GPP working groups impacting the core network are SA2 and CT1, 3, 4. These four groups define the overall architecture of the mobile system, including the architecture of the core network, and specify Stage 2 description and Stage 3

signaling of network features. Figure 5 shows the evaluation of 3GPP core network standardization leadership for Rel-18 5G contributions up to functional freeze (December 2023).

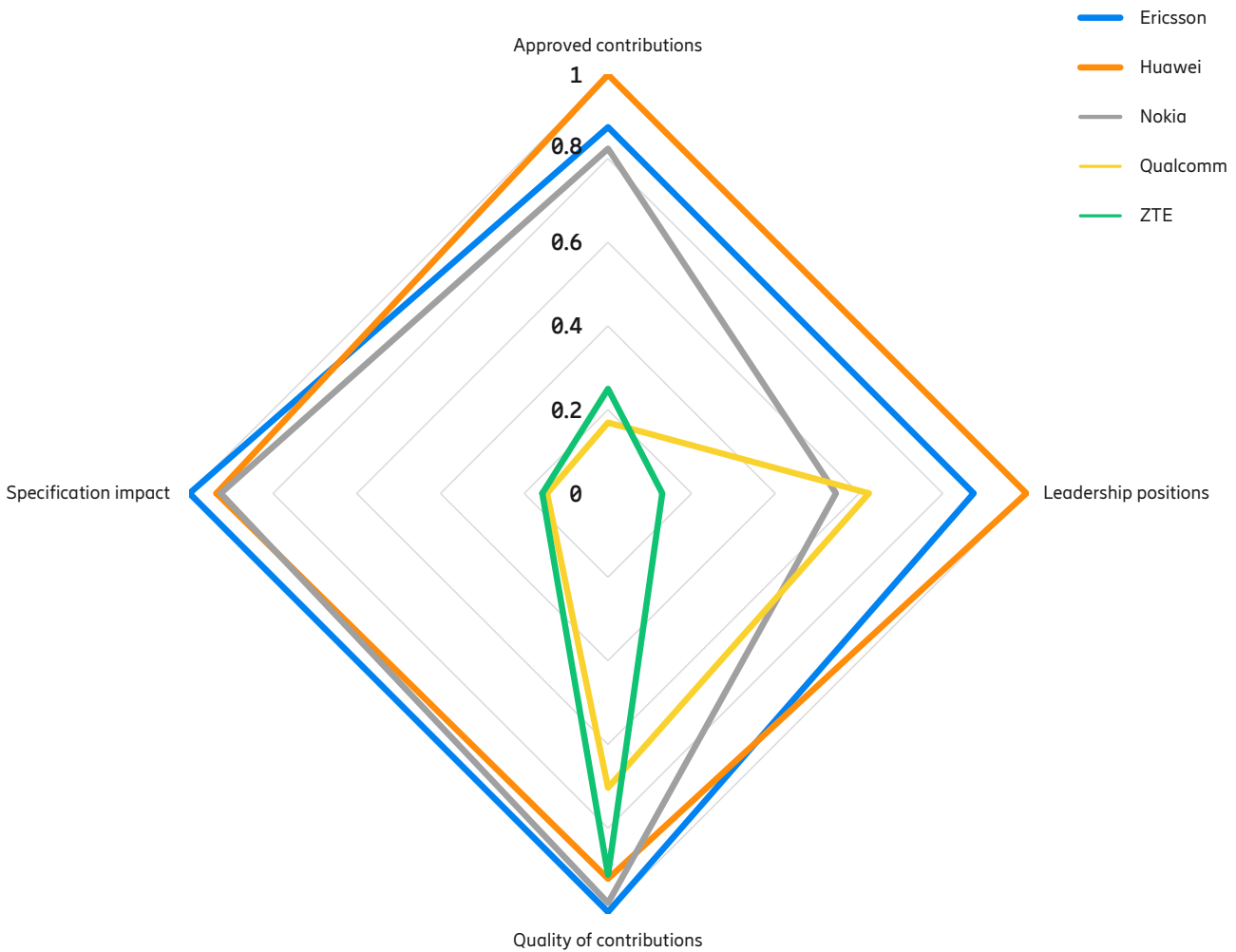


Figure 6: Evaluation of standardization leadership in 3GPP Core Network. Note that the leadership positions are limited to chair and vice-chair positions in SA2, CT1,3 and 4.

Summary

Like in earlier 3GPP releases, Ericsson stands out as a technology leader among many companies contributing to 5G standardization in 3GPP Release 18.

In this report, we have evaluated the standardization leadership for 3GPP Release 18 up to functional freeze. 3GPP Release 18 marks the start of 5G Advanced and builds on the 5G baseline defined by 3GPP in Releases 15, 16, and 17. 5G Advanced will enhance network performance and add support for new applications and use cases. It is expected to bring significant enhancements in terms of 5G performance, support for new services and applications, sustainable networks and Intelligent network automation.

We have evaluated the leadership in RAN and core network areas separately, as companies in 3GPP focus on different working groups depending on their business impact. For both RAN and core networks, it is clear that Ericsson stands out as a leader from a long tail of companies contributing to 3GPP Release 18 standardization.

Ericsson's high-performing networks provide connectivity for billions of people every day. For nearly 150 years, we've been pioneers in creating technology for communication. We offer mobile communication and connectivity solutions for service providers and enterprises. Together with our customers and partners, we make the digital world of tomorrow a reality.

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