



POSITION PAPER

Towards a Horizontal Market for Radio Equipment and Reconfigurable Radio Systems (RRS)

June 2024

Key points

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- European digital SMEs have largely centred business activities around software innovation, making use of third-party hardware to run their software. A certain **degree of openness is thereby required from the part of hardware vendors** for the sustainability of their business model.
- It is crucial to **avoid a very narrow interpretation of the provisions of the Radio Equipment Directive**, which would promote proprietary methods and only allow hardware vendor-provided software to be accepted by the hardware.
- Enabling a horizontal market **goes beyond competitiveness and allocative efficiency considerations** and has considerable ramifications on the circular economy.
- While SBS welcomes the efforts to reduce as much as possible the margin for interpretation via a new approach in the ongoing standardisation work around Article 3.3.(d)(e)(f) of the RED, and calls for it to be maintained in the future work on reconfigurability, it urges the European Commission to **not over-prolong the decoupling in timing of the respective delegated acts for Article 3.3.(d)(e)(f) and Articles 3.3.(i) and 4**.
- SBS calls for the **introduction of a new work item to be put forward in line with the future activation of Articles 3.3.(i) and 4**, centred around open standard mechanisms such as asymmetric key and certificate-based authentication.

Background

The [Radio Equipment Directive 2014/53/EC](#) (RED) establishes a regulatory framework for placing radio equipment on the EU market. Due to the industry's increased digitalisation, this Directive has gained in importance as the scope of the RED covers devices that use the radio spectrum for communication purposes. All internet-connected wireless devices (including, for example, IoT devices) fall under this Directive. Radio equipment can change its behaviour or be reprogrammed at the upload of new software – the key feature exploited by reconfigurable radio systems (RRS).

A variety of equipment placed on the market can thereby be reconfigured through software. Yet, due to global price competition in the hardware sector, SMEs hold a particular prominent role in the software market. They rely in large parts on hardware manufactured by third-party enterprises; as such, to ensure business continuity they need a certain degree of openness.

This is precisely what a horizontal market requires: one where customers can buy hardware and software from different vendors and combine them into a system. Such a process offers a greater degree of flexibility, reduces costs, is more environmentally sustainable, and enhances European digital sovereignty by reducing dependencies on extra-EU based hardware providers.

Yet, through reliance on third-party hardware, software-developing European SMEs are left at risk of potential lockdown of devices. This is why SBS has long advocated for a clear framework setting the foundation for hardware/software disaggregation, allowing SMEs to openly develop software on existing hardware.

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This position paper builds from previous contributions on the topic. In November 2019, SBS had published a [first position paper](#) in response to an impact assessment conducted by the European Commission, in line with an Open Public Consultation which aimed to gather stakeholder feedback. It examined the ramifications of Article 3.3.(i) and Article 4 of the RED (pertaining to reconfigurability), ensuring that its applicability and proposed delegated acts would not go against the principle of an SME-favourable horizontal market. In particular, SBS called for:

- The need to clarify responsibility and liability through a clear legal framework, in order to avoid hardware vendors' fear of possible liability generated by software vendors and thereby lock down their hardware to avoid compliance issues;
- Limiting the application of Article 3.3.(i) to devices that have a significant privacy/fraud protection risk, strictly avoiding any veto power to hardware vendors.

Since the publication of this initial position paper, standardisation work around the RED has however essentially focused on Article 3.3.(d)(e)(f) - namely the cybersecurity implications of the Directive. Such work is overseen by CEN/CENELEC JTC13/WG8 since July 2022, with delivery of the standards expected on 30 June 2024 and application on 1 August 2025. The work on Article 3.3.(i) and 4 is therefore foreseen to pick up, starting with a new Commission-mandated study on reconfigurable radio systems. This study is

expected in Q2 2024, and is to be conducted across the year through consultation of different concerned stakeholders.

With this new position paper, **SBS wishes to once again put forward the strong request that a horizontal, interoperable market is not hindered by future standardisation work in the area.** Excessively narrow interpretations of the provisions of the Radio Equipment Directive, which could lead to veto power and ‘lock-in’ mechanisms by hardware companies at the detriment of software-developing SMEs, must be avoided.

Relevance of a horizontal market for European SMEs

Nowadays, technology hardware is mainly produced outside of Europe. Globalisation and cheaper prices have led Asian countries, notably Taiwan and China, to become the world’s hub for hardware manufacturing. As a direct consequence, European digital SMEs have largely centred business activities around software innovation – making use of third-party hardware to run their software on directly. This enables consumers a wider range of low-price devices, with a variety of software quality add-ons.

For such a business model to succeed, SMEs thereby require a certain degree of openness from the part of the hardware vendors. An effective horizontal market, where hardware and software are properly disaggregated, empowers SMEs to innovate freely. In essence, a disaggregated smartphone would for instance let the user select which operating system it would like to use, as well as any other additional software application. The benefits of such a conception go beyond the sole SME angle; in cases of lock-in, where only proprietary software can run on certain devices, innovation is stifled and prices rise. European competitiveness is *de facto* hampered, with reduced allocative efficiency.

Last, enabling the flourishing of a horizontal market goes beyond pure competitiveness considerations. It also has a tremendous impact on the circular economy – a strategic European goal which was recently raised through the [Right to Repair Directive](#) common agreement by the European co-legislators. By hindering secondary use, linear vertically integrated approaches entail a significant environmental weight. In some cases where incumbent vendors have cornered a market on both the hardware and software sides, it can be common to require an annual license to operate the devices. In most deployments, after a certain amount of years of operation, devices are replaced not necessarily because they are obsolete, but because the license expires. Vendors can leverage this opportunity to force a refresh of the hardware, selling the new generation of products while bundling them with significantly discounted software licenses as a marketing incentive. By opposition, promoting hardware and software disaggregation extends the lifetime of devices, by avoiding such bundling practices – and ultimately limiting e-waste.

Ongoing standardisation related to Article 3.3.(d)(e)(f)

The [RED Delegated Regulation \(2022/30\)](#) supplements the original Radio Equipment Directive, activating its essential requirements referred to in Article 3.3., points (d), (e), and (f). The respective points call for:

- “radio equipment [that] does not harm the network or its functioning nor misuse network resources, thereby causing an unacceptable degradation of service” (d);
- “radio equipment [that] incorporates safeguards to ensure that the personal data and privacy of the user and of the subscriber are protected” (e);
- “radio equipment [that] supports certain features ensuring protection from fraud” (f).

A formal standardisation request was published in August 2022. Standardisation work then initiated in September 2022, within CEN-CENELEC’s JTC13/WG8. As work is in its final stage - an amendment request was put forward to the European Commission in 2023, requesting to delay delivery of the standards to 30 June 2024, SBS stresses the necessity to avoid a mere trade-off between security needs and reconfigurability in the application of these standards.

Current work has defined “authentication mechanisms”, that are supposed to allow software to be installed on equipment in a secure way, i.e. preventing cybersecurity attacks. It is important that hardware manufacturers do not interpret such provisions in a restrictive way, by locking down their hardware. Traditional approaches have tended to adopt proprietary methods to only allow software provided by the vendor to be accepted by the hardware. Yet such a narrow interpretation would make it impossible for 3rd party software to be loaded, preventing a horizontal market to flourish. Concomitantly, this would lead to the use of in-house protection mechanisms, which are usually weaker than the standardised ones.

SBS welcomes the efforts taken by the members of the JTC13/WG8 to address the European Commission’s initial comments of March 2023, and reduce as much as possible the margin for interpretation via a new approach with more precise wording. Vague terminology such as “intended use”, or “intended operational environment of use” have been cast out in the rewriting of several mechanisms. Such an approach should be maintained in future work on reconfigurability, around Articles 3.3.(i) and 4. Nonetheless, SBS urges the European Commission to not over-prolong the decoupling in timing of the respective delegated acts for Article 3.3.(d)(e)(f) and Articles 3.3.(i) and 4, as to reduce the likelihood of hardware vendors to lock-down devices.

Activation of Articles 3.3.(i) and 4: proposal for a new work item

Building from these considerations, and in light of the upcoming work on reconfigurability around Article 3.3.(i) and Article 4, SBS intends to propose a new work item in this direction to relevant European Standards Organisations.

Essential requirements under Article 3.3.(i) call for radio equipment to “support certain features in order to ensure that software can only be loaded into the radio equipment where the compliance of the combination of the radio equipment and software has been demonstrated”. Article 4 further clarifies on the modalities for provision of information on the compliance of combinations of radio equipment and software.

However, the authenticity mechanism developed under the ongoing standardisation work around Article 3.3.(d)(e)(f) is currently defined in generic terms. This may lead some hardware vendors to simply lock their hardware with some in-house authentication system preventing 3rd party software from being loaded.

The defined mechanism for Article 3.3.(i) should thereby be in line with the reasoning expressed regarding the ongoing standardisation work around Article 3.3.(d)(e)(f). For an effective horizontal market, software vendors should be able to load their software readily on third party hardware without any kind of interference by hardware vendors, with no additional layer of complexity which may disincentivise users. Similarly, the 3.3.(i) requirements’ implementation should not make software providers bear the substance of the compliance costs.

Addressing this, SBS is in favour of the adoption of open standard mechanisms, such as asymmetric key and certificate-based authentication. In essence, this means that the adoption of independent third-party Certification Authorities (CAs) would allow seamless third-party software authentication. A hardware company’s products would not only include its own (CA) certificate, but also third-party’s ones. This would render the process more secure, and also easier to allow the extension of the list of allowed software providers. In fact, products that adopt this architecture would be able to authenticate and hence securely adopt software provided by any 3rd party whose CA is pre-loaded on the unit. Further still, a single CA certificate provided by an independent entity may act as liaison and enable software to be provided in a secure and traced way from multiple companies, with no need to extend the list of CA certificates on board.

Adopting an open standard does not mean reinventing the wheel. In the same way that currently an Apple device (such as a laptop) can open third-party websites safely, precisely because Apple devices have not only the Apple pre-loaded Certification Authority certificates but also the ones of the organisations that certificate third-party websites (such as VeriSign, GoDaddy, etc), a similar framework could become common in the hardware industry - unleashing the potential of the horizontal market, and SME innovation in the software space.

Towards this goal, SBS aims to initiate a new work item at European level, after prior discussion with relevant stakeholders to identify the best place to carry out such work.

Conclusion

Following a horizontal market approach is essentially a dual opportunity for hardware vendors alongside software ones: if a hardware product is enabled to run third-party software, its value can increase with the ability to address a variety of new and different use cases otherwise impossible. In such a scenario, a hardware vendor can also leverage the products of these third-party software companies to generate additional demand for their hardware.

SBS looks forward to engaging with the contractors of the upcoming study on reconfigurable radio systems on the developed points, and advancing discussions with relevant European Standards Organisations. Technical work will nonetheless also have to be paired with a substantial mentality shift. Even with an available standard following the criteria expressed in this paper, the transition to a horizontal market will not happen automatically. Long-rooted habits may take longer to budge. Political messaging at European level may therefore be necessary at a later stage as a complementary step to the technical work, in order to better drive the shift towards a true horizontal market.

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Small Business Standards (SBS) is the European association representing and supporting small and medium-sized companies (SMEs) in the standardisation process, both at European and international levels.

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