



Interworking Submission on Behalf of the Home Office

Introduction

1. The Home Office considers that the services provided over the Airwave Network have certain characteristics that give rise to adverse effects on competition, which require structural remedies (among other remedies or recommendations) to resolve. These characteristics have been discussed elsewhere¹ and are due to the monopoly position enjoyed by Motorola, including Airwave, resulting in significant market power enabling Motorola to keep prices high and maintain strong bargaining power to affect contractual negotiations (reinforced by the issue of asymmetric information in favour of Airwave and Motorola).
2. The Home Office, in its response to the CMA's Issues Statement, amongst other things, urged the CMA to consider structural remedies² that would provide the Home Office with flexibility to contract with an alternative provider of Mission Critical Push-To-Talk (MCPTT) services to the Emergency Service Network (ESN).³ In particular, the Home Office encouraged the CMA to consider directing Motorola to provide a fully documented and supported interface, including an application programming interface (API), if needed, to allow interworking⁴ between the Airwave Network and ESN during the period over which users of the Airwave Network transition to the ESN.

A non-network solution, allowing communications between the Airwave Network and the ESN, would be suboptimal and, depending on the solution, give rise to communications control problems, mobile devices effectively gaining dispatcher (high) priority for normal calls, problems with scaling and transition problems. The Home Office therefore considers a network-to-network (interworking⁵) solution necessary for an effective and safe transition that is acceptable to users. Annex 1, which is a technical annex, explains the available interworking and non-network solution options and their respective advantages and disadvantages. An effective interworking solution is dependent on Motorola; the need for interworking therefore provides Motorola with a mechanism through which to delay transition, should Motorola so choose.

3. The purpose of this Interworking Submission is to expand on the Home Office's earlier Response to the CMA's Issues Statement, explaining in greater detail why an interworking

¹ See for example paragraphs 20 to 25 of the Home Office's Response submission of 19 January 2022 to the CMA's Issues Statement.

² That is, structural remedies other than requiring Motorola to divest Airwave.

³ Paragraph 59 of the Home Office's Response submission to the CMA's Issues Statement, 19 January 2022.

⁴ Interworking is the term used by the Home Office for the ability of two or more different communications networks or services to work together or interoperate to enable users of each service to communicate as fully and effectively with one another as possible.

⁵ For the purpose of this submission, interworking solution refers to a solution that enables interoperability.

remedy is necessary to ensure the efficient and effective transition of users from the Airwave Network to the ESN.

Interworking and Competition

4. Interworking⁶ plays an important role in promoting competition on and between networks, platforms and services, including where there has been a competition for the market and it is necessary for a replacement network, platform or service to transition or migrate users from the incumbent network, platform or service.⁷
5. A well-designed interworking⁸ remedy can help address harmful market features.
6. Communications networks and digital platforms connect users and enable interactions to occur, empowering easier and instantaneous or near instantaneous voice and data communications, with modern communication digital platforms utilising the broader bandwidths available to additionally enable the provision of novel products and services (video and picture sharing, GPS and location services, etc.). In many sectors this has led to the creation of new markets or the reshaping of existing markets, with examples ranging from retail banking to travel accommodation. The Airwave Network and the ESN are both examples of digital communications networks.
7. The value of communications networks, including digital platforms, stems partially from the strong network effects they generate and, for some platforms, their significant economies of scale and scope, allowing rapid expansion and extension to new applications. However, these key characteristics of communications and digital platforms can also mean that incumbent players are likely to enjoy enduring market power, with reduced levels of competition in (or for) the market.
8. While network effects and economies of scale and scope phenomena are not restricted to communications networks, communications networks, in particular, do give rise to a number of concerns. These concerns include:
 - **user 'lock-in'**: in the case of Airwave and ESN, transition may be dampened if users are reluctant to switch to an alternative or replacement provider. This reluctance can stem from high switching costs and the loss of the benefit of network effects, including fear of the loss of the ability to connect with users of the incumbent network or platform, such as, in this case, the Airwave Network. When lock-in effects are high, this may result in higher prices and/or lower quality being offered. For example, incumbent firms may lack the incentive to provide an adequate level of service if they know that users cannot or will not easily switch away. In the case of emergency service users, as the consequences of suboptimal, unreliable or failed service could be catastrophic, reluctance to switch may be heightened. Incumbent firms (such as Motorola) may therefore be incentivised to magnify these 'lock-in' effects in order to protect their position or, at least, may lack the incentive to ease any 'lock-in' effects.

⁶ And additionally, data portability. Data portability is the ability to transfer a user organisation's or an individual user's relevant data held on one network, platform or service to another network, platform or service. The Home Office is considering whether there is any such data for which a data portability obligation would be needed in addition to an interworking remedy.

⁷ It is not feasible to switch over from the Airwave Network to ESN in one go, rather, it is necessary to transition users over an extended period of time.

- **ecosystem type effects:** communications networks are often associated with vertically integrated business models (for example, through the formation of product ‘ecosystems’). The Airwave Network is an example of such an ecosystem. These models can bring efficiencies, incentivise investments and enable beneficial offers to users. However, they may also enable and incentivise anticompetitive behaviour on the part of dominant firms. This can give rise to a number of vertical (and other harms), including vertical foreclosure, high or abusive pricing, and delayed or a lack of innovation in new services. Mergers, including the acquisition of potential future competitors or, in the case of the ESN, the acquisition of the legacy network provider combined with winning the award of the contract to provide its replacement, may facilitate these anticompetitive behaviours.
 - **demand side-effects:** features on the demand side may affect competitive dynamics. Biases can result in inertia and this may be exacerbated where users have concerns (accurate or misplaced) about the comparability and interworking of competing or replacement products or services. For example, users of an incumbent platform may be reluctant to switch to a more innovative or higher quality alternative until it has been proven in the field. This type of behaviour is likely to particularly arise with risk adverse service users, users such as the police, where service failure may directly result in physical harm or loss of life. Such users may also be unwilling to switch where there is a lack of interworking, due to uncertainty around ability to communicate with the same range of users on the new network as on the incumbent network (since any new platform may lack adequate network effects to be immediately attractive or required functionality may be lost during transition).
 - **delivery restraints:** transition to a replacement network may be limited or delayed due to the need for an interworking solution, including the provision of associated support services and the sharing of necessary data by the incumbent. Where an interworking solution, access to and use of data and / or the provision of support services are required to transition users to a replacement service, incumbent firms will have little incentive to allow data to be easily shared (e.g. with rivals, potential entrants or users themselves) or to provide an interworking solution and any necessary associated support services.
9. As such, interworking measures or remedies that focus on allowing a replacement network or service to communicate with the incumbent network or service can be effective in addressing certain market features giving rise to adverse effects on competition; an effective interworking remedy would allow users to switch services and networks without losing demand-side network effect benefits.
10. Indeed, interworking⁹ measures have been implemented as remedies in several sectors to address similar competition concerns, including in fixed line telecommunications where network access, interconnection and switching are regulated through Ofcom’s general conditions on entitlement to provide service, and in retail banking where the CMA established the Open Banking Implementation Entity (OBIE) to, amongst other things, design APIs to enable interworking between different service providers. Further, the European Union competition regulation of large ‘gatekeeper’ technology platforms, the forthcoming EU Digital Markets Act, will oblige messaging services to enable interworking

⁹ Often referred to in those contexts as interoperability measures.

as one measure to address competition concerns.¹⁰ While these case examples have different individual circumstances to the present case, (including the precise technical requirements), the Home Office considers that they illustrate how remedies to enable interworking and associated services can, and are, used to address competition concerns.

Interworking and the Airwave Network

11. While not a modern broadband platform, the Airwave Network provides digital communications that benefit from network effects (since the potential benefit each user gains increases as the number of other users increases). Additionally, the Airwave Network, with some limited exceptions, operates as a closed ecosystem, with Airwave essentially providing a vertically integrated land mobile radio communications solution for Great Britain's emergency and associated services.
12. As a predominately closed terrestrial trunked radio (TETRA¹¹) system, utilising mainly proprietary hardware and software, including operational support systems (OSS) and business support systems (BSS), a replacement service wanting to transition users from the Airwave Network must either: (i) obtain access to and the ability to interoperate with the Airwave Network; or (ii) persuade Airwave Network users to use its services knowing that they will not be able to communicate with users of the Airwave Network.¹² The latter is simply not an option for Great Britain's emergency services given the essential role emergency services communications play in ensuring public safety and the safety of emergency services' personnel.

Interworking and the ESN

13. A key component of both the Airwave Network and the ESN is push-to-talk (PTT) functionality. PTT functionality is an essential network technology that enables instantaneous and efficient group communications. At the click of one button, users are able to immediately connect with other users (including all users within a predefined user group), without the need to setup and place a call, thus avoiding the time taken to dial a number, for a call to be connected and then answered (and for group calls, for additional users to be added one by one to the call). In an emergency services context, PTT functionality is a vital safety feature that must function across both the Airwave Network and the ESN during user transition.

Kodiak MCPTT

14. ESN uses a MCPTT solution to, amongst other things, replicate the Airwave Network's (TETRA) PTT functionality. The current ESN MCPTT solution, Kodiak MCPTT, is a carrier-integrated solution¹³, that is mostly compliant with 3GPP standards (which are international mobile communications standards developed by the Third Generation Partnership Project (3GPP)¹⁴).

¹⁰ European Parliament (2022), 'Deal on Digital Markets Act: EU rules to ensure fair competition and more choice for users': [Deal on Digital Markets Act: ensuring fair competition and more choice for users | News | European Parliament \(europa.eu\)](https://www.europarl.europa.eu/news/en/press-room/2022/06/statement-20220623110001).

¹¹ The TETRA air interface is standardised to allow use of radios from multiple vendors, but is otherwise largely proprietary.

¹² Additionally, the high cost of building a competing service and the finite user base gives rise to an additional barrier to market entry.

¹³ i.e. the solution, while separate from the mobile carrier network, works with that mobile network to provide a unified service.

¹⁴ <https://www.3gpp.org/about-3gpp>.

15. Kodiak Networks, the provider of Kodiak MCPTT, is a wholly owned subsidiary of Motorola.¹⁵ As part of the same group, Motorola is able to control the interworking between the Airwave Network and the Kodiak MCPTT as an extension of a closed ecosystem and sustaining lock-in effects.
16. As part of a change to the Framework Arrangement, Airwave / Motorola have developed an interworking solution, including interfaces, that enable the Kodiak MCPTT service to interoperate with the Airwave Network [✂]. Annex 1 to this Interworking Submission describes the technical characteristics of the interworking solution, in other words, what it does, how it works, where the equipment is located and who (Airwave or Kodiak) is responsible for what aspects. Annex 1 also describes alternative interworking solutions and their respective advantages and disadvantages.

Alternative MCPTT

17. As a result of Motorola's delivery failures, resulting in substantial delay to ESN, the Home Office intends to procure an alternative MCPTT service (Alt-MCPTT).
18. For all users to effectively transition from the Airwave Network to the ESN utilising an Alt-MCPTT, the Alt-MCPTT would require network access to and interworking with the Airwave Network on at least the same or on an as equivalently good basis as the access and interworking Motorola has developed between the Airwave Network and the ESN for the Kodiak MCPTT.

Interworking Obligations

19. The Home Office would prefer a centralised network-to-network interworking solution¹⁶, similar to the solution applied by Airwave and Kodiak (see Interface Point Option 2, Table 2, Annex 1); however, the specific structure and location of the interface point would be dependent on the Alt-MCPTT solution's needs.
20. So far as the Home Office is aware, Motorola has not provided such an interface (whether Interface Point Option 2 or any other solution) to any third-party. Motorola therefore effectively locks Dimetra¹⁷ customers into buying both switching and base site infrastructure from Motorola.
21. The current contractual requirements on Airwave to provide interworking are limited and do not extend to Motorola; the requirements are set out in the 2018 Airwave Extension Term Sheet, at Schedule 1: Key Terms, Airwave Interface Commitment, which provided that,

[✂]

¹⁵ Motorola announced the completion of its acquisition of Kodiak Networks on 28 August 2017: <https://www.motorolasolutions.com/newsroom/press-releases/motorola-solutions-completes-acquisition-kodiak-networks.html>.

¹⁶ The ESMCP has considered alternatives to a centralised solution; however, these less integrated solutions, for example, dual carrying of Airwave and ESN radios by users, audio patching using control systems, are rather crude, do not scale well, and do not have User buy-in.

¹⁷ Motorola's TETRA product line that is the basis of the Airwave service: https://www.motorolasolutions.com/en_xu/products/tetra/infrastructure.html.

22. To enable effective competition and the effective transition of users from the Airwave Network to the ESN, the Home Office believes the should CMA impose an interworking remedy that, amongst other things¹⁸, provides that Motorola and / or Airwave shall:

- (1) Obligation to negotiate and provide an interworking solution on reasonable request: to the extent requested by the Home Office or any other purchaser or provider of radio services for emergency and associated services or MCPTT services for emergency and associated services, in any part of Great Britain (an Access Seeker), negotiate with that Access Seeker with a view to concluding an agreement for interworking, interconnection and network access (or an amendment to any existing agreement for such things) within a reasonable period and in any event no longer than [a period the CMA considers appropriate] months, which agreement shall be on (i) fair, reasonable and non-discriminatory terms, conditions and charges and which must be at least equivalent to any internally provided interworking, interconnection and network access; or (ii) on such terms, conditions and charges as the CMA directs from time to time.¹⁹
- (2) Provision of or publication of required information: upon reasonable request by an Access Seeker, provide to that Access Seeker such information as may be reasonably required to enable that Access Seeker to make a request for and negotiate interworking, interconnection and network access, and that information must be provided within a reasonable period and in any event within a period no longer than [a period the CMA considers appropriate] months.

Ensure that the information and support provided includes all such information in relation to the provision of, interworking, interconnection and network access as provided by Airwave to Motorola and/or Kodiak, including, for the avoidance of doubt, information, including the technical specification, in respect of the Airwave Network to Kodiak interworking solution.

- (3) Undue discrimination: not unduly discriminate against any Access Seeker (which may include the Home Office), in relation to the provision of interworking, interconnection and network access.²⁰ In this respect, the Home Office suggests that Airwave and or Motorola should be deemed to have shown undue discrimination if either unfairly favours to a material extent an activity carried on by Airwave or Motorola so as to place the Home Office or another Access Seeker at a disadvantage.²¹
- (4) Associated facilities: provide such associated facilities and services as may be required to ensure or support the delivery of an effective interworking solution.

23. Further the Home Office would encourage the CMA to consider the extent to which specific and detailed interworking remedies or directions are required covering issues such as: (i) the provision of high level and detailed designs; (ii) deliverables, milestones

¹⁸ For example, the provision of necessary and associated service and functions, including skilled support and technical services, dispute resolution, provision of necessary data, data operability (if required), etc.

¹⁹ Ideally, the charges for interworking would form part of a charge control remedy.

²⁰ For example, to avoid the exploitation of users.

²¹ For example, discrimination through price, quality of service and innovation promotion to only certain users.

and statements of work; (iii) security; (iv) data sharing; (v) outline and detailed implementation plans; and (vi) testing, verification and acceptance.²²

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²² As an example of the detail that may be required for an interworking remedy, please see the Framework Arrangement's Change Control Note, number CCN 186, in respect of the Kodiak Interoperability Project raised on 26 April 2019; however, the detail required for a third-party solution may necessarily differ from that detail required for the Kodiak solution.

Annex 1

[✂]

Annex 2

Glossary

While most abbreviated terms are defined within the text above, we have included a glossary of acronyms for the CMA's ease of reference.

Term	Meaning
3GPP	Third Generation Partnership Project
Alt-MCPTT	Alternative MCPTT service intended to be procured by the Home Office
API	Application Programming Interface
BSS	Business Support Systems
CAN	Change Approval Notice
CCN	Contract Change Note
CEN	European Committee for Standardisation
CENELEC	European Committee for Electrotechnical Standardisation
CEPT	European Conference of Postal and Telecommunications Administrations
ESMCP	Emergency Services Mobile Communications Programme
ESN	Emergency Services Network
ETSI	European Telecommunications Standards Institute
GPS	Global Positioning System
ICCS	Integrated Communications Control Systems
IEC	International Electrotechnical Committee
ISI	Inter-System-Interface
ISO	International Organisation for Standardisation
ITU	International Telecommunications Union
MCPTT	Mission Critical Push-To-Talk
NIS	Network Interworking Solution
NSS	Non-Standard Services. Refers to those organisations that require a high level of security within their communications.
OSS	Operational Support Systems
PTT	Push-To-Talk
TETRA	Radio technology standard (upon which Airwave Service is based)
WRG	Wave Radio Gateway
ZC	Zone Controller