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Summary of submitted responses to the RFI in the upcoming procurement of MCX-platform to SWEN

Abstract

In June 2025, MSB published a Request for Information (RFI) concerning Mission Critical services (with reference to RFI MCX reference number 25/180).

This document presents a summary of the findings based on the received responses and subsequent follow-up discussions. MSB considers the document to provide a reasonably accurate representation of the current market situation of MCX offerings that can be delivered within the year of 2027 to 2028.

The purpose of this summary report is to share an update of the collected MCX market that can help other PPDR operators in their journey towards Mission Critical Services, as well as provide feedback to the market.

The report may also together with the needs described in the RFI document be taken as input by MCX solution suppliers when defining their roadmaps.

Definitions and abbreviations

3GPP	3rd Generation Partnership Project
AOSP	Android Open Source Project
EUCCS	EU Critical Communications System project
GCF	Global Certification Forum
ISSI	Individual Short Subscriber Identity (for TETRA)
IWF	Interworking Function
iOS	Apple's mobile operating system
KPI	Key Performance Indicator
MCS	Mission Critical Services
MCCO	Mission Critical Communications Operator
MCX	Another term for MCS
MDM	Mobile Device Management
MSB	Myndigheten för Samhällsskydd och Beredskap
PPDR	Public Protection and Disaster Relief
PPDR Operator	Operator serving PPDR users. A PPDR operator is an example of an MCCO
QPP	Quality, Priority and Pre-emption
RASCI	Responsible, Accountable, Supportive, Consulted, Informed
RFI	Request For Information
SaaS	Software as a Service
SDK	Software Development Kit
SDS	Short Data Service
TCO	Total Cost of Ownership
TETRA	Terrestrial Trunked Radio
UO	User Organisation
UX	User Experience

Introduction

In June 2025, MSB published a Request for Information (RFI) concerning Mission Critical services, MCX (RFI MCX reference number 25/180). The purpose of the RFI was to obtain a clear picture of the market situation, including the scope and maturity of available offerings.

The RFI invited responses addressing MCX solutions comprising MCX server, client, dispatch, admin components, and optionally an MCX client middleware SDK. Respondents were requested to describe their product offerings as planned for release by 2027, allowing full field implementation for commercial trials during the year of 2028.

MSB received a total of fifteen responses. Of these, eight covered MCX solutions addressing all requested components. The remaining responses provided information about individual components of MCX solutions, such as SDK, dispatch, or other relevant elements within the broader MCX ecosystem, including devices. In general, the responses were of high quality, and MSB acknowledges the efforts made to understand our needs and to propose solutions accordingly.

The structure of the document follows that of the original RFI and covers the following areas:

- Migration from TETRA to MCX
- MCX end user functionality
- MCX mobile and dispatch clients
- Devices and third-party MCX clients
- Architecture
- Operations and maintenance
- MCX server-server interoperability
- Standards and certification
- Deployment Project
- Installed base
- Commercial offerings

In the following, quantitative terms are used, such as “some”, indicating at least two suppliers offer, and “most”, indicating that at least half of all MCX solution suppliers offer a specific capability within the designated time frame. Emphasis in this document is put on those respondents that offer all the requested MCX components, namely MCX client, lightweight dispatch, server and admin function.

MSB extends its appreciation to all parties that submitted responses. It is our expectation that this summary may also be of relevance to other countries that have plans to procure and implement MCX to PPDR and other areas.

Migration from TETRA to 3GPP MCX

MSB described in the RFI the planned migration journey from TETRA via a migration solution and ultimately to MCX. The RFI questions related to migration focused on how to enable smooth and gradual transition of users from TETRA to MCX allowing users to intercommunicate across technology borders during the migration period.

For interoperability during migration, most suppliers find an approach feasible either based on 3GPP MCX IWF-TETRA or 3GPP MCX-MCX (server-to-server) interoperability, the latter was recommended in case the said migration solution offers a corresponding 3GPP interface. Some suggested a gateway solution based on Rakel proprietary control room interfaces.

In case of MCX integrating to TETRA via IWF this could be provided either by interfacing to an IWF gateway, or directly with the TETRA network. An IWF gateway could in turn translate between 3GPP MCX IWF interfaces and either to TETRA ISI or to a proprietary interface supplied by the TETRA supplier. The IWF gateway could be provided by a third party with good understanding of TETRA and MCX IWF, some suppliers indicated it could be included as part of the offered solution while others indicated it should be sourced separately. Several respondents point out that challenges can occur related to the traffic load on the TETRA-MCX interface, for example, during the peak of the migration period when half of users are on MCX and half on TETRA. In the case of Sweden, more than half of PPDR traffic is between user organizations, which is why migrating entire end user organizations in one "go" may not necessarily reduce traffic significantly on the MCX-TETRA interface.

Also, in case of IWF based interworking, respondents point out that it is important that there is open collaboration between the MCX supplier and the TETRA supplier who needs to open up its technology for integration with MCX. In comparison, the TETRA ISI interface is less commonly adopted than P25 ISSI (P25 is used, for example, in the US) which indicates that a closer collaboration between suppliers is required.

Most suppliers point out that an MCX – MCX interface will cater for all the necessary functionality for a migration to a 3GPP MCX platform, and also provide the availability and capacity that is needed for Swedish end user organisation during migration.

MSB concludes that the current state of IWF interface or gateway and market adaptation of this functionality is currently not sufficient for Sweden migration needs.

MCX End user functionality

End user features are the driving purpose for an MCX system. Most users will expect continuity with functions they use today in the first place, and then look for extended multi-media services on top of the basic services.

All suppliers offer basic PTT and messaging features and all advertised some level of 3GPP compliance. 3GPP compliance levels varied from release 14 to 18, with some suppliers actively working towards later releases. Some responses included specific 3GPP

references that they aligned with, whilst others had less clarity about their levels of compliance.

For temporary groups, some suppliers offer the full range of group-regroup, user-regroup and ad-hoc calls. Some implemented temporary groups through ad-hoc calls alone. Some allow the constituent members of a temporary Group to be changed after creation, whilst some do not. In some solutions, the extent of 3GPP compliance for temporary groups was not clear. The overall feeling from the user organization perspective was that for most suppliers, temporary groups are not yet mature enough for flexible collaboration between agencies and between MCX systems.

All suppliers have geographic groups or plan to implement them by the time of the proposed deployment in 2027. Some implementations have proprietary components, particularly where it was considered that the 3GPP specification is not complete. In these cases, manufacturers were actively looking to close compliance gaps.

Callback requests to a group is an important feature that is not explicitly defined in 3GPP. Most suppliers offer 3GPP 1-1 callbacks, but callbacks to a group generated some discussion. Some suppliers recommend employing enhanced status messages in way that is sometimes done with Tetra status messages. This relies on third party mobile and control room systems working together to implement sending, queuing and responding to callbacks.

For emergencies, most suppliers offer a good range of 3GPP compliant dedicated group call emergencies, current Group emergencies and emergency alerts. One complex use case in Sweden for handling multiple separate emergencies was a challenge for everyone. This requires a single operator in the nearest control room to dedicate themselves to a single incoming emergency. Functional aliases were suggested by some for call routing, while other suggestions included writing proprietary modifications for this use case.

Most suppliers offer man down capabilities in their MCX client, with successful operation dependent on available device hardware.

For handling large lists of contacts, most suppliers offer a search facility and a favorites option. Some offer the capability to group certain categories of users together, including users from other tenants and other MCX systems. There was similar variety in the capabilities offered for handling large numbers of groups.

For hidden users it was pointed out that although this is mentioned in the 3GPP stage 1 document, the protocol is not yet fully defined. Some suppliers suggested configuring an anonymous human readable identifier such as "---". There were also suggestions of how to implement the feature in a bespoke way prior to a complete 3GPP definition.

Some user organisations anticipate MCX allowing roles to be handled in a more flexible way than is possible today. Every supplier offered options for specifying user characteristics through user profiles, including profile specific lists of contacts and

Groups. For the full role handling functionality offered by 3GPP, most suppliers either already have or plan to implement Functional Aliasing.

For user onboarding, most suppliers have some form of MDM support, although some have limited options focused on username and password. For security when devices are used by many users from a device pool, some suppliers support clearing down user data at logout.

All suppliers supported visibility of who is affiliated to a group, though for most this is an on-demand polling operation. Nevertheless, some suppliers offer the capability to subscribe for real time affiliation information as is done with Tetra today.

Implementation of location services varied widely from a full 3GPP LMS, to proprietary solutions with the intention to implement 3GPP location services in due course. Most suppliers support map servers in a closed network off the internet. Some suppliers support rate of mobile location reporting varying with speed of the device.

All suppliers support a range of video services including group calls and private calls. Most allow only one video stream per user, although some do support multiple streams.

All suppliers support basic data services including SDS messages with the addition of file attachments. Most support Enhanced Status Messages. Some suppliers support MCS IP Connectivity to allow third party applications to transfer data protected by MCS security and with quality of service.

Every supplier offers a fleet management and configuration tool with a wide range of features, and with different permission granularities. These include the ability to manage inter-tenant collaboration, and in some cases manage communication between tenants on different MCX systems. Most suppliers offer a configuration management API to allow in house systems to manage user and group definition, and some have no API limitations when compared with the configuration tool itself. The implementation of fleet mapping differs between suppliers; how complex and nested hierarchical handling of organisations and sub-org organisations can be provisioned etc.

MSB concludes that it will not be possible to procure an off the shelf system that meets all the end-user requirements. A suitable approach is to procure a system based on use cases, together with a development project to ensure that specific end-user requirements and features can be implemented. This approach will require close collaboration between the procuring part, end-user and the supplier, specifically in areas UX and useability that are hard to define and through procurement requirements. This requires that the requirements are tested by end-user during operational piloting and feedback given to the supplier.

Mobile MCX client and lightweight dispatch client

All MCX solution suppliers provide Android mobile clients, while some also offer iOS mobile clients (for iOS it is not specified whether these are intended for business-critical or mission-critical deployments).

An MCX mobile client graphical user interface is offered by all suppliers. Several suppliers can additionally provide an optional "feature phone" form factor user interface resembling the TETRA user experience.

Most suppliers are of the view that device firmware adaptation or MCX client customization is likely required to optimize audio performance, battery consumption, push-to-talk experience, and to meet the 3GPP-defined MCX KPIs for a particular device.

Mobile Device Management (MDM) is generally supported for MCX mobile client distribution, while support is more limited with respect to configuration of the client.

Most MCX clients support the removal of personal data upon logout, and some also enable separation of user data when different users may use the same device but at different times.

All suppliers offer a lightweight dispatch component. In some cases, dispatchers are executed on desktop platforms utilizing MCX client-server interface but with extensions beyond 3GPP. Other lightweight dispatchers include a backend server component that resides either within the User organization or the PPDR operator. Having such a server component brings up needs for O&M, availability, security etc that need to be managed.

The choice of MCX system, and MDM system, can affect the underlying architecture for the communication system. For instance, when it comes to lightweight dispatchers suppliers offers web based, or on-prem solutions.

MSB concludes that not all suppliers fully support a third party Mobile device management solution, which needs to be considered during the procurement and requirement processes.

Devices and third party clients eco system

All suppliers provide a device life cycle management (LCM) process, covering new device onboarding and management throughout its life cycle, to ensure proper operation after, for example, a new client release or Android upgrade. Some suppliers also maintain a device catalogue, offering pre-certified and life cycle managed devices "out-of-the-box".

Half of the suppliers offer MCX mobile client SDK middleware directly, while the other half rely on a partner for SDK provision. No supplier specific SDK was approved for use against an MCX server from another supplier in a multi-vendor environment, with several respondents arguing that MCX client middleware may best be delivered by a separate supplier, who is independent of the MCX server used.

For control room integration, most suppliers provide 3GPP MCX client-server interface with proprietary extensions. Positioning and administration are specifically mentioned as areas where such extensions are applied. It is pointed out that work is ongoing within TCCA to propose extensions to be incorporated into future standardization. Some suppliers also provide a "headless" MCX client that interacts with the MCX server and exposes RESTful APIs or similar interfaces upon which applications can be developed.

Recording is not yet standardized by 3GPP. Yet most suppliers offer a recording option either as part of own portfolio or together with a 3rd party. Majority of offered solutions require central storage of recorded media. Client-based recording approaches are available but may not capture all media traffic, such as one-to-one calls. Some suppliers employ a SIPREC-based approach, which they state enables capture of all media, including one-to-one calls without the need for PPDR operator to store recording data.

MSB concludes that 3GPP is not fully sufficient today for control room systems and recording, which is why further TCCA and 3GPP standardisation effort is needed.

MSB also concludes that to host recording data can be difficult due to security needs from end-user organisations. In some cases, there is a need for tenant based solutions that capture all media and speech to text that PPDR user organisations are obliged to store. This poses a set of difficulties that needs to be addressed in the procurements, such as the long term version stability of potentially proprietary interfaces towards end-user organisation control room solutions.

Architecture

Most solutions are primarily delivered as virtualized deployments. However, several suppliers are in the process of transitioning specific components toward cloud-native architectures. As a result, some implementations consist of a hybrid model, where certain functions continue to operate in virtual machines while others are containerized and orchestrated through cloud-native platforms. Over time, a larger share of solution portfolios are expected to shift from virtualization to fully cloud-native operation.

All suppliers support both local and geographical redundancy. In terms of geographical - redundancy, most solutions are implemented in an active–standby configuration, although some suppliers offer active–active setups. Failover times vary considerably, resulting in different levels of service impact. Only few suppliers extend geo-redundancy beyond two sites. Only a few suppliers support regional autonomy; that is, in a geographical redundancy setup, an MCX server instance can serve local users even if separated from the other MCX server instances.

All suppliers report capability to operate when there is no internet access.

Several suppliers support up to 5,000 affiliated users in one group in unicast mode, with various innovative mechanisms to scale beyond this limit. The number of provisioned users within a group can be significantly larger than 5,000. There is ongoing debate regarding the most effective 3GPP call model for large groups whether prearranged or chat groups, pre-established media sessions or on-demand sessions provide the optimal balance between performance and resources consumption.

Approaches to managing network congestion also differ. During group call setup, when one requested bearer is unavailable, some suppliers abort the call, others proceed with a default bearer, while some allow those call participants which received requested QPP to

continue based on defined thresholds. Some suppliers offer possibility to configure the behaviour in case of network congestion.

All suppliers report support for MCX multicast over eMBMS.

MSB concludes that the area of redundancy, autonomous operation and failover impact is complex. Considering its criticality, it is suggested that PPDR operators spend significant effort to get deeper understanding of offerings and capabilities during the procurement process to fit operational needs, regarding latency issues and number of sites as well as other areas. The critical components and the choice of underlying architecture in the communication system, such as virtualisation platform, can impact geographical redundancy, including latency requirements, and needs to be addressed in the procurement of the MCX platform.

MSB also concludes that network congestion handling needs to be properly tested and managed during deployment and configuration of the MCX platform in close cooperation with the suppliers.

Operations and maintenance

Although not deeply assessed in this RFI some suppliers also provided information regarding their FCAPS support, meaning management of faults, configuration, accounting, performance and security.

Typically, there are multi-tenant web based interfaces mainly focusing on provisioning, and also dedicated interfaces for provisioning, alarms, KPIs etc. for OSS/BSS integration.

For example, all suppliers systems can produce KPI output data which in general needs to be collected and processed by other tools which are not provided as part of the MCX solution.

MCX Server-Server Interoperability

All suppliers have plans for MCX server-to-server interoperability aligning with 3GPP (for example MCPTT-10) interfaces.

With the current lack of GCF certification for servers, suppliers are relying on the EUCCS initiative to drive the market towards interoperability in order to enable cross border communication.

3GPP allows group calls to be conducted according to several different call models, such as prearranged group calls versus Chat groups. Media sessions may be established on demand or pre-established. Respective call model provides its pros and cons, but if different MCX solutions do not support all possible call models this might limit MCX server-to-server interoperability.

MSB concludes that that the market is at an early stage regarding interoperability and GCF certification. Collaboration between countries is crucial to establish the needed functionality for interoperability.

Standards and certification

It is encouraging that there is already an MCX client as well as MCX device certified under the GCF framework for 3GPP Mission Critical Services that was activated mid 2024.

A majority of MCX solution providers have a plan to achieve GCF conformance certification of their MCX client by latest 2027.

A majority also have a plan to GCF interoperability test their client or server with a 3rd party server/client, also by latest 2027

There are however suppliers that point out that the current GCF certification is already outdated as it is based on 3GPP release 14, and it therefore needs updating.

As mentioned earlier, in the absence of MCX server-to-server certification much hope is put on the ongoing EUCCS preparation initiative.

It is important for MSB to use 3GPP standardised systems and products in order to get full interoperability for the MCX ecosystem. MSB concludes that suppliers need to certify their systems and adhere to the 3GPP and GCF roadmap evolution

Deployment Project

Suppliers estimate deployment projects to range from approximately 9 to 24 months from contract signed until ready for production. When including also the migration of control room operations, the estimated duration extends beyond and may be outside of project control as user organizations often own and control these assets.

A key success factor emphasized by several suppliers is the importance of reaching early agreement on interfaces and the detailed Statement of Work (SoW) and the presence of a RASCI matrix. Clarity in these areas is considered essential to ensure end-to-end integration, avoid misunderstandings during implementation, and maintain alignment between stakeholders throughout the implementation project and beyond.

The main cost drivers for the deployment need careful consideration of

- Number of licenses for the MCX platform
- Planning of the deployment with stated payment milestones.
- Early end user involvement
- End-to-end functional deployment and testing

It is also important to manage the way new features are introduced in the MCX platform and to the user organizations.

MSB concludes that the procurement needs to address questions regarding collaboration between multiple suppliers and MSB as well as other key success factors such as control of cost drivers and development of new features.

Installed base

All suppliers provide in-production customer references. The scale and maturity of these references vary considerably. Some suppliers report hundreds of provisioned users, while others list deployments with hundreds of thousands of users. In several cases, solutions are designed and dimensioned for large-scale use but are in an early stage, with only a limited number of users onboarded. This reflects the current state of live MCX service deployments by PPDR operators, of which only a few exist globally on a larger scale.

Most, but not all, suppliers have live references using network priority (QPP). Introduction of MCX and QPP brings some technical complexity in general, and additional lead time may be required for integration and test in case this has never been done in live production.

MSB concludes that the responses indicate a wide disparity in supplier maturity and proven field performance. Certain solutions are well established and validated in large-scale operations, while others remain at a relatively early stage of market adoption.

Commercial offerings

Both perpetual, Software-as-a-Service (SaaS), and hybrid commercial models are presented. Software price elements may consider number of provisioned users, concurrent traffic load and other factors. The variety of models and SW packaging approaches indicates flexibility but also reflects a certain level of immaturity in the market.

Estimated total cost of ownership (TCO) varies significantly across responses, further suggesting that market pricing is not yet well established.

During supplier dialogues, MSB requested input on how suppliers believe requirements should be formulated to best capture the desired solution. In relation to 3GPP compliance, suppliers did not favour a blanket compliance declaration. A more effective approach may be to describe key use cases, followed by a defined set of "essential features and capabilities" potentially supported by a GCF conformance certificate. This would provide assurance that essential capabilities are present and implemented in line with the standard. Under such an approach, however, no capability can be taken for granted unless explicitly stated. This will require the procuring PPDR operator to carefully consider and articulate, in sufficient detail, the requirements to be included.

MSB concludes that the commercial models vary and not all models suit the needs for a governmental mobile communications operator who needs strict control of the commercial model.

MSB further concludes that the commercial agreement needs to support a development based approach where new features and capabilities can be developed upon request from MSB.

MSB further concludes that the suppliers prefer to have a use case based approach to definition and development of features. This needs to be paired with 3GPP requirements for essential features and capabilities, supported by certification.

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