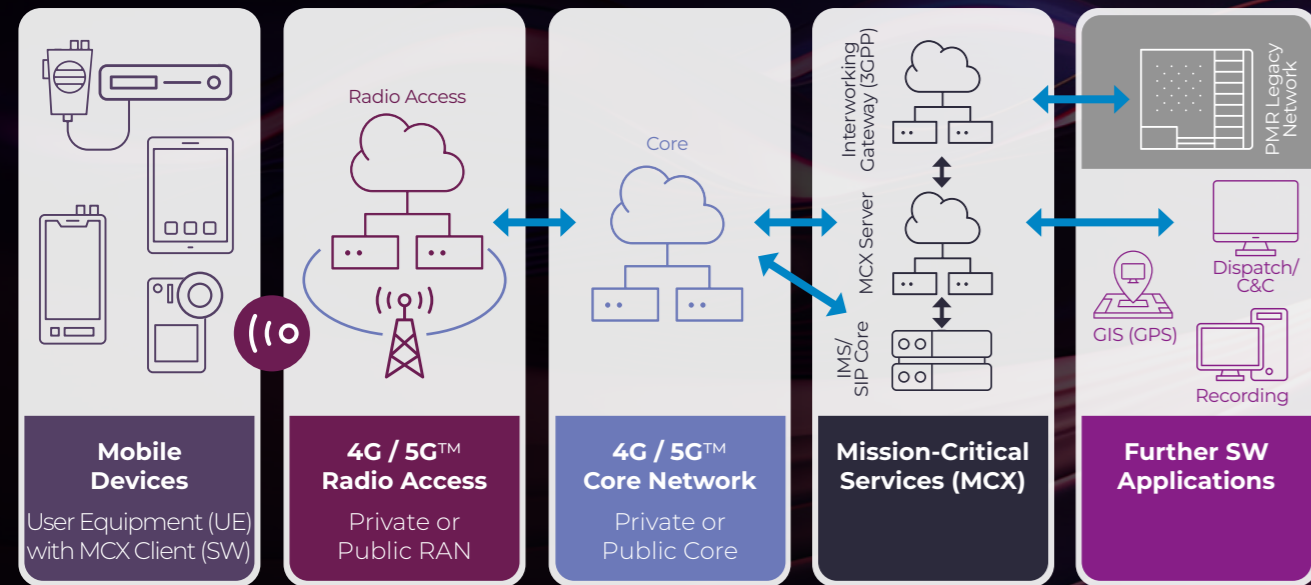# THE MCX ECOSYSTEM FROM HMF
ADAPTS TO SUIT ANY ENVIRONMENT

The MCX system solution can be used with public, private or hybrid LTE™/5G™ mobile radio networks and uses standardised functions and interfaces (Rx/N5 interface and QoS Class Identifier (QCI) 65, 67, 69 and 70 in accordance with the 3GPP standard) to ensure the low latencies and quality of service (QoS) of critical communication via a dedicated QoS bearer.

HMF offers additional command centre and dispatching software applications for professional users working in mission- or business-critical environments to enable application-centred use. Multimedia recording systems and geographical information systems (GISs) can also be deployed as requirements dictate in order to provide a bespoke solution tailored to the

specific sector. Thanks to the use of 3GPP-standardised interfaces, there are no limits in terms of providing and connecting up more software applications.

The modern, intuitive MCX software client is quick and easy to install on mobile terminals, and users can choose what terminals to use MCX on. The MCX client software, which complies with the 3GPP standard, follows a platform-agnostic modular design approach incorporating the latest web technologies. As well as various commercially available terminals, a range of ruggedized terminals with dedicated push-to-talk (PTT), emergency call or group dial buttons and industry-specific accessories can also be used in professional use cases.

Mobile Devices	4G / 5G™ Radio Access	4G / 5G™ Core Network	Mission-Critical Services (MCX)	Further SW Applications
User Equipment (UE) with MCX Client (SW)	Private or Public RAN	Private or Public Core		

The MCX software client can also run on hybrid communication devices and allows users to access mission-critical services (MCX) in virtually any work environment, in all areas and using various kinds of terminal. These hybrid communication devices thus complement MCX communication with the addition of traditional mission-critical narrowband radio tech-

nologies – on a convergent device and in a unique combination.

The conformity and interoperability of HMF's MCX solution has been confirmed at several MCX Plugtests™ events organised by the international standardisation group ETSI.

CRITICAL COMMUNICATION –
IT'S A QUESTION OF TRUST

The powerful MCX communication services provided by HMF Smart Solutions enable groups of users across various industries to improve the coordination, productivity, safety and security of their mobile first responders and work teams. They thus benefit from fully integrated turnkey solutions featuring devices tailored to their needs and supplementary software applications – all aligned with their processes and existing systems.

Rather than offering "off-the-peg" communication applications, HMF develops customised, German-engineered solutions for reliable speech, video and data transmission:

Maximum flexibility for closed user groups thanks to a wide range of options for mobile terminals – matching usage profiles and tasks (from smartphones and ruggedized PoC devices through to tablets, bodycams and much more).

Seamless integration into the mission-critical TETRA radio infrastructure ACCESSNET®-T IP via powerful, 3GPP-standardised gateways and interfaces using uniform and convergent call identities ("unified identity").

All aspects considered: individual and sector-specific user requirements, local market conditions such as the availability of frequency resources/spectrum, and the optimisation of investment and operating costs (CapEx/OpEx).

Users benefit from HMF's over 40 years of experience in planning, equipping and running mission-critical infrastructure solutions and an extensive managed services portfolio.

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MISSION-CRITICAL SERVICES (MCX)
MADE IN GERMANY

UNCOMPROMISING MISSION-CRITICAL BROADBAND COMMUNICATION

The pioneering MCX communication solution from HMF Smart Solutions delivers mission-critical multimedia communication services in line with the 3GPP standard that have been designed specifically for the needs of professional users in various segments of the professional mobile radio industry. Boasting maximum security for real-time communication, uncompromisingly fast call setup and versatile interoperability, MCX is nothing less than the next step in the evolution of professional mobile and government radio.

hmf-smart-solutions.com

STANDARD AND INNOVATION
NEED NOT BE MUTUALLY EXCLUSIVE

MCX is the perfect choice when companies or government authorities need to standardise their critical broadband communications. Regardless of whether first responders or members of work teams are spread across several sites, cities or even regions, the intuitive PTT functionality allows teams to communicate in real time and improves the coordination, the productivity and, not least, the safety and security of mobile teams and units.

Besides a wide range of professional speech, video and data services for private calls (1:1) and group calls (1:N), the innovative MCX system solution from HMF Smart Solutions also comes with features such as mobility management, access control, resource allocation and user/device identity management. MCX from HMF thus takes critical communication up to the next level. The innovative MCX solution is designed for maximum performance and availability. Easy to set up and upgrade, it thus meets the global standard of the 3rd Generation Partnership Project (3GPP) for mission- and business-critical applications in full. This means that the interoperability it offers can help users cut costs.

The 3GPP identified all manner of different mission-critical communication services (MCX) for LTE™ as part of its Releases 13 and 14 for mobile radio and is continuing to develop this further for 5G™ in its Releases 15, 16, 17 and 18 in order to ensure ongoing improvement and evolution.

The MCX server architecture uses microservice and containerisation designs to enable resource-efficient operation, straightforward scalability and setup, and upgrade costs that are easy to keep a handle on.

Unique characteristics

- Rapid, top-quality call setup and a wide range of multimedia call services
- No investment in radio infrastructure required; compatible with existing mobile radio networks (LTE™/5G™) – developed to provide a guaranteed level of QoS and service availability
- Can also be used with 5G campus networks in business-critical applications
- Open, standardised system architecture in accordance with 3GPP Release 17 – with comprehensive interoperability (manufacturer-agnostic)
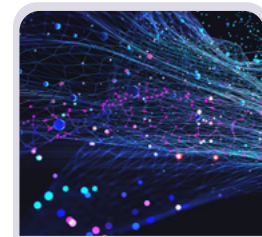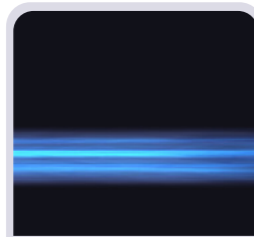
MCPTT
Mission-critical push-to-talk
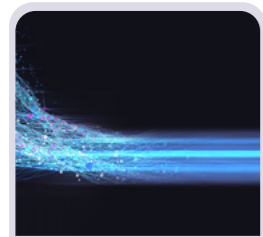
MCDATA
Mission-critical data

MCVIDEO
Mission-critical video

Mission-critical services (MCX) are those used to provide the mission- and business-critical transmission of speech, video and high-speed data via public, private or hybrid mobile radio networks (LTE™/5G™).

READY FOR ANYTHING YOU CAN THROW AT IT

HMF's MCX solution is well placed to handle the increased communication requirements of various different industries as it is ideally suited for and precisely tailored to the relevant fields of application, including mission- and business-critical user profiles – from first-aiders through to the private sector.

For public safety authorities and organisations in particular, MCX is an essential tool for speeding up and maximising situational awareness. Communication is not impeded, e. g. by potential civilian influences, as an emergency progresses. It ensures the fast and guaranteed transfer of different kinds of safety-critical information and media between specialist applications supporting the mission (e. g. database queries, video transmission and analysis, mission data, etc.). With all the information to hand, teams can thus make decisions swiftly and efficiently and resolve situations before they turn dangerous.

HMF gives users of modern critical communication systems and services a quick and cost-effective way to expand their mission range and thus overcome the limitations imposed by their traditional radio communication – with just one tap of their finger.

As an experienced full-service provider, HMF will put together the ideal portfolio for the use case at hand, combining its professional MCX mission-critical application with suitable mobile terminals and powerful system applications.

SECURITY AND RELIABILITY TO PROTECT PEOPLE AND PROPERTY

Protecting the confidentiality and integrity of communication is a fundamental aspect of HMF's MCX solution. The powerful MCX solution thus comes with a wide range of security features that cover every conceivable threat scenario, including client, server and data transmission security as well as backing up management applications. The system provides comprehensive security in areas including:

- Protection of the signalling level
- User authentication and authorisation
- RTCP security (e. g. controlling permissions to transmit and monitoring transmission)
- Protection of inter-/intra-domain interfaces
- Security of data signalling
- End-to-end security for user content
- Regular key updates
- Single sign-on (SSO)

As well as encryption providing an effective way to prevent eavesdropping, 100% communication confidentiality is also guaranteed by features including fully encrypted connections, multiple supported encryption methods, encryption of the local memory/database of the mobile MCX software client and management of the device hardware whitelist.

For the network management applications, the system offers access guidelines, firewall and port opening guidelines, system hardening and logging, and additional functionality to ensure data security. The Information Security Management System of HMF Smart Solutions GmbH is certified in accordance with ISO 27001:2022.

AVAILABLE WHEN YOU NEED IT

With its cloud-native architecture, HMF's MCX solution supports installation, provisioning and operation both locally and in a public cloud.

It deploys various tools to meet the requirements of professional communication users in terms of maximum availability and reliably, flexibly scalable capacity combined with optimum resource efficiency, and continuous upgrades and updates without disrupting operations. These include stateless services, highly available data storage, dynamic routing, a microservice architecture throughout and an integrated orchestration and containerisation design.