

# Multi-agency and multi-deployment mission critical communication Network Applications

## SUMMARY

The solution proposed may also be considered as two inter-related Network Applications, Full MCX Server Network Application and MCX Dispatcher Network Application. While the MCX Server Network Application encompasses the main elements for MCX (MCPTT, MCVideo and MCDData), such as Key Management Server (KMS), Configuration Management Server (CMS), etc., the MCX Dispatcher Network Application offers a way to create and provision campaigns, workgroups, etc.

## RECOMMENDATIONS

The MCX deployment has the following dependencies:

- Network: Container Network Interface (CNI) (any should work).
- Storage: Container Storage Interface (CSI)
- Seamless monitoring: Kubernetes Prometheus operator is required. External access to services, which can be configured to use LoadBalancer or NodePort. The system is by default configured to use LoadBalancer:
- If LoadBalancer is to be used, the cluster where the services are deployed must have a LoadBalancer instance. So far, metalLB has been chosen.
- If NodePort is to be used, it does not have any requirement.
- RTPengine requires to be able to deploy it in hostnetwork mode.
- Deploying tool: Helm is required. It is not necessary to use Helm on the host machine. Helm can be used in a remote machine pointing out to the host machine.

## MICROSERVICES



NEM's MCX solution is entirely based on Kubernetes. The service can be deployed using Helm, a package manager for Kubernetes. It helps to deploy applications reading the templates, deploying the services accordingly. If the cluster environment does not support Helm, it can be used from an external machine pointing out to the cluster.

A summary of the different microservices (NFs) is given below:

- **MCX AS:** It is responsible for providing control and management of communications (MCPTT-voice-, MCVideo-video- and MCDData-data-). The MCX AS could be divided in two main roles in the system:
  - The **MCX Controlling Application Server (CAS):** It handles the floor control for both private and group calls, and it forwards media flow as well. Besides the MCX Participating Application Server, the MCX CAS could also communicate with other CAS or non-Controlling AS(s).
  - The **MCX Participating Application Server (PAS):** It handles the communication with the MCX clients, and plays the role of a relay point for floor control between the MCX clients and the MCX CAS. It also manages access and priority control of users to the communication in place; and access control to MCX clients triggering communications (checking the capabilities of each).
- **Identity Management Server (IdMS):** It is responsible for authenticating an MCPTT client in the system. The server is provisioned with the client ID, MCPTT ID and password.
- **Configuration Management Server (CMS):** It is responsible for managing the MCPTT/MCX configurations, such as user profile, UE configuration, functional aliases and service configurations.
- **Group Management Server (GMS):** It is responsible for managing the groups' information. The groups could be either formed by clients/users, or other groups (group regroup).
- **Key Management Server (KMS):** It is responsible for the distribution and storage of security keys and information like encryption keys for the communication of MCPTT calls (private and group); Short Data Service (SDS) data protection; management server safe; and integrity-based communication (both signalling and media).
- **Session Initiation Protocol (SIP)/IP Multimedia Subsystem (IMS) Core:** provides the SIP core required as a SIP register and message forwarding framework. This SIP core comprises different elements: Proxy Call Session Control Function (P-CSCF); Interrogating CSCF (I-CSCF); Serving CSCF (S-CSCF); and Home Subscriber Sever (HSS).



## CONTACT

For more information, do not hesitate to visit the website <https://www.5gepicentre.eu/> and/or contact the 5G-EPICENTRE team.

Contact the 5G-EPICENTRE team by filling in the [form](#) provided. Apply [here!](#)

Follow Us on our social media for more Network Applications trends:



## 5G-EPICENTRE Experimentation Platform

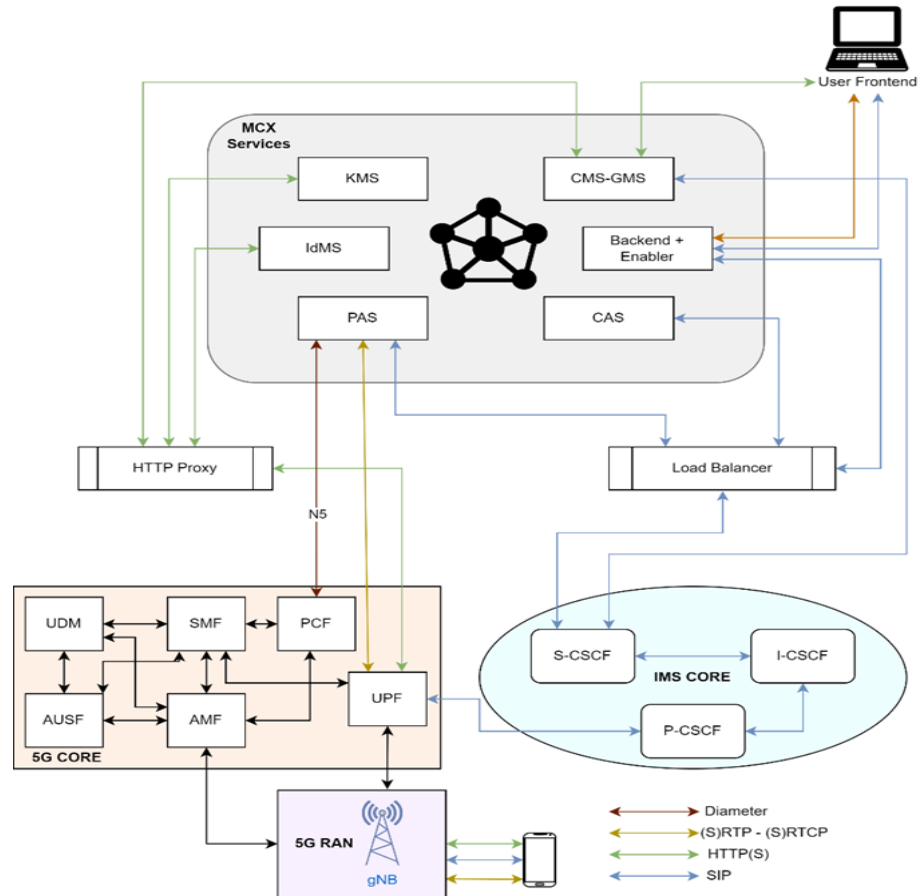
ReShapinG the Future of  
PPDR Services



## MICROSERVICES OF MCX APPLICATION

- The **Backend + Enabler**: It manages sessions between server and end users, and implements different interfaces and translation for non-MCPTT systems with MCPTT devices.
- **Non-relational database (DB)**: It is used to store dynamic information, like registered users.
- **DB**: SQL DB used to store micro-service configuration information.
- **Enabler-WS**: Backend used by Dispatcher.
- **HTTP-Proxy**: middleware of external HTTP traffic, that inspects HTTP traffics redirecting it to the corresponding micro-service.
- **MCPTT-Exporter**: module that exports monitoring information according the monitoring process instantiated (RabbitMQ or Prometheus).

The following figure presents the vertical system's specific architecture.



5G-EPICENTRE's Multi-agency and multi-deployment mission-critical communication Network Application