

GCF MCX CERTIFICATION – A KEY STEP IN ENABLING END TO END MISSION CRITICAL SERVICES OVER MOBILE BROADBAND

Mr. Asif Hamidullah
Head of Certification – IoT & Verticals
GCF



ROHDE & SCHWARZ

Make ideas real





GCF MCS Certification – A key step in enabling end to end Mission Critical Services over Mobile Broadband

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Asif Hamidullah, Head of Certification – IoT & Verticals



GCF – the mobile and IoT industry's mobile certification

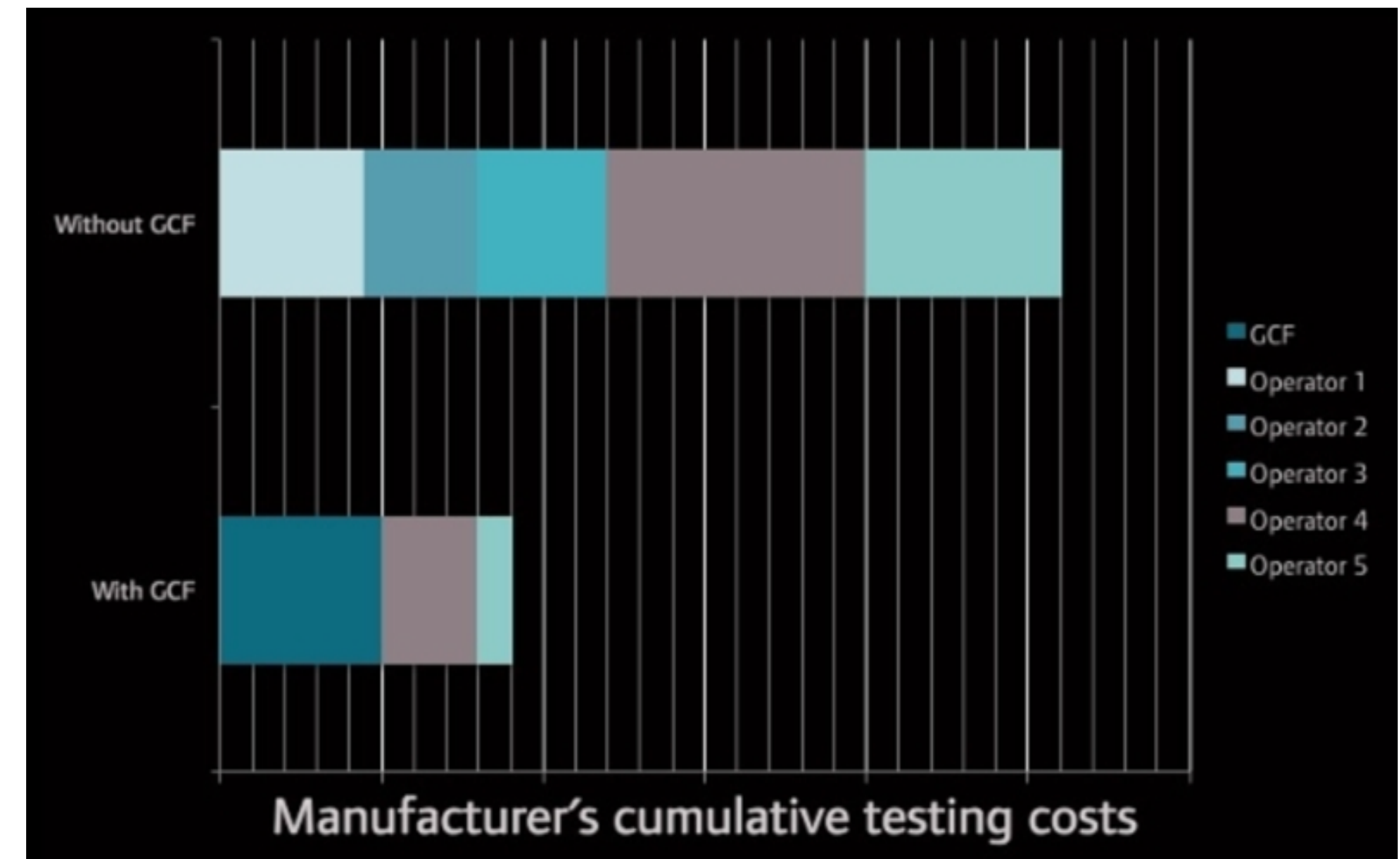
- **GCF manages a global device certification scheme**
- **Most major mobile and IoT global brands participate**
 - 350+ member companies
 - Collaborative participation between Operators and Service Providers, Device and IoT Manufacturers, Test Industry and Industry Partners
 - More than 600 device models certified annually (smartphones, wearables, modules, IoT end products, etc.)
- A **GCF certified product provides confidence** that the device interoperates with the network, reducing time and costs for Operators/Service Providers and Manufacturers.



GCF Certification helps ensure device interoperability with networks while amortising initial costs across multiple deployments

What is GCF Certification?

- **Complements regulatory schemes**
 - Focus on **RF, RRM, Protocol** testing
- **Certification Criteria based on standards**
 - From SDOs like **3GPP** and **GSMA**
- **Focused on:**
 - Providing a platform for harmonisation of testing
 - Avoidance of duplication of testing
 - Reducing testing overheads for Manufacturers and Operators
- **Proven Interoperability**
 - > 20% lower dropped call rates (2G, 3G, 4G) compared to non-certified devices
- **GCF manages a full certification eco system**
 - Validated test cases from SDOs
 - Lab recognition program based on **ISO 17025**
 - Industry agreed procedures & test methodologies
 - Online certification portal available **24/7/365**



Membership categories

- There are currently three main membership categories: **Operators**, **Manufacturers** and **Observers**
- Each member has different categories, with different privileges and access to GCF Services
- Full Operator and Full Manufacturer members have voting rights at general meeting



Manufacturers

- Full Manufacturer
- Associate Manufacturer I
- Associate Manufacturer II



Operators

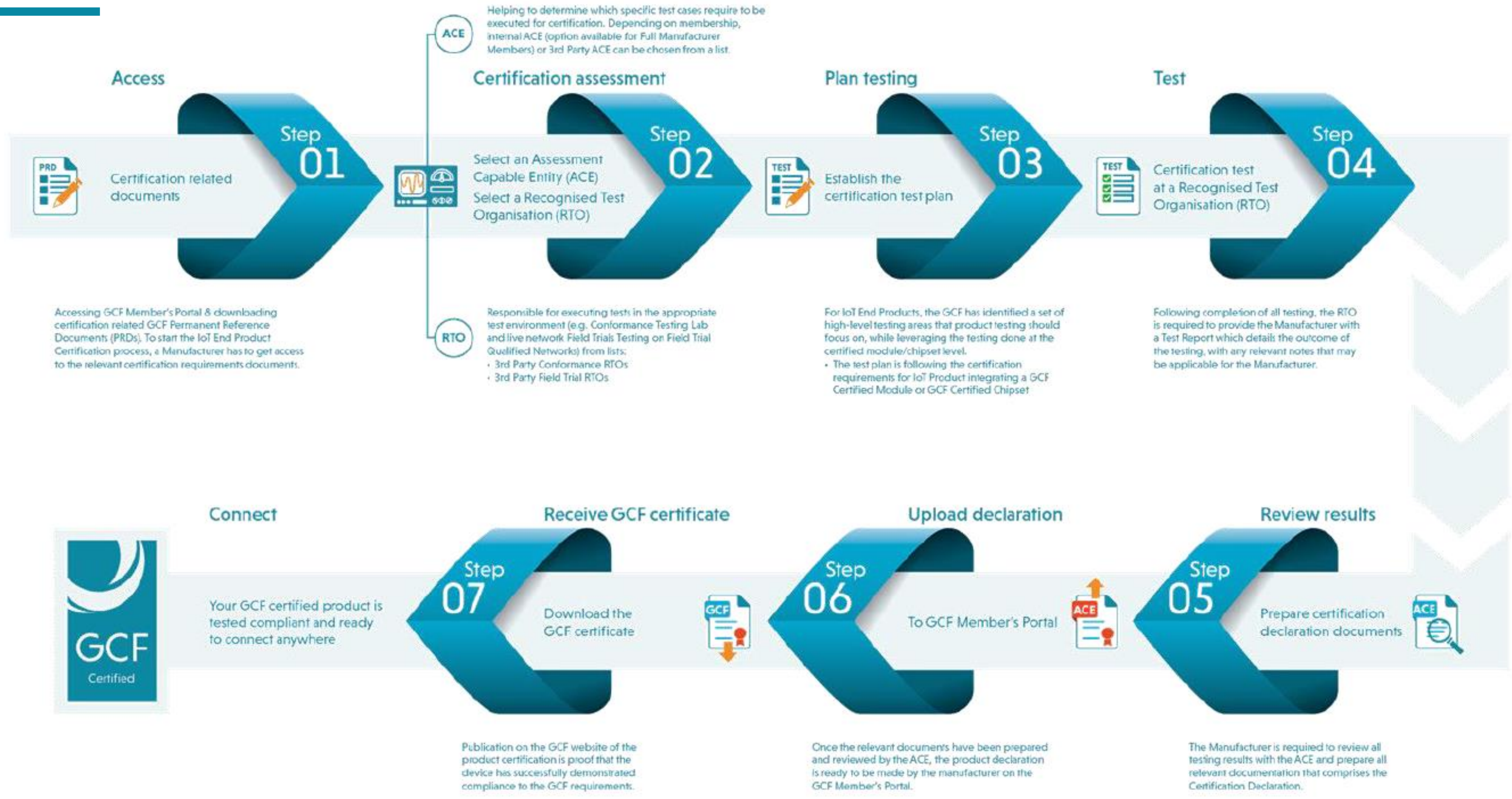
- Full Operator
- Associate Operator
- Mission Critical Operator
- Mobile Virtual Network Operator (MVNO)
- Associate MVNO



Observers

- Recognized Test Organization
- Assessment Capable Entities
- Test equipment manufacturers
- Infrastructure manufacturers
- Any other member type

GCF Certification Process



Critical Communications: TCCA and GCF

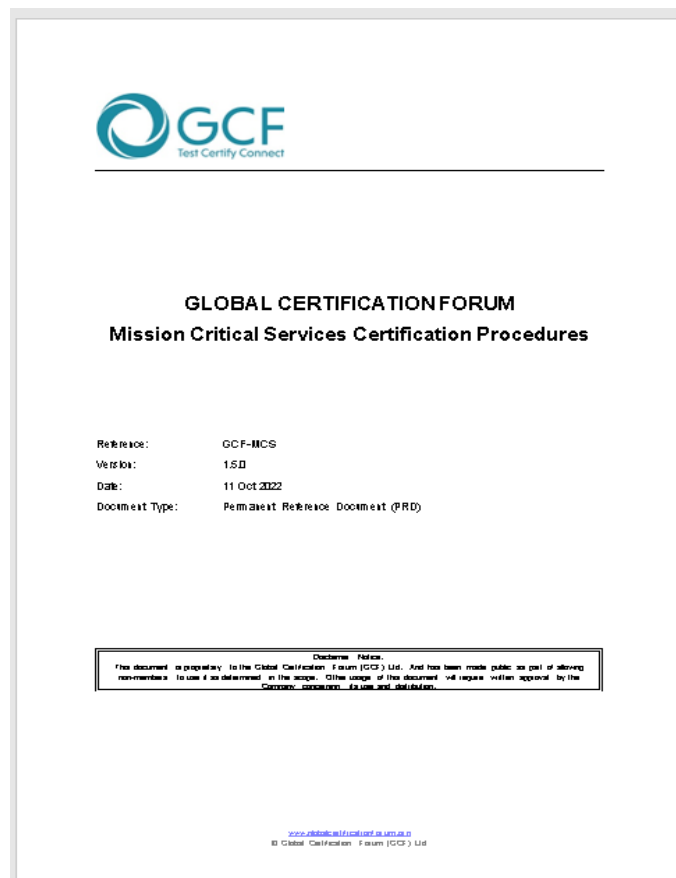
A Strategic Partnership...

- GCF and The Critical Communications Association (TCCA) developing and managing an MCX Product Certification Programme
- Leverage TCCA's extensive knowledge base in MCX and GCF's certification best practices
- Partnership cemented via the creation of the **Mission Critical Services Work Stream (MCSWS)**
- Group open to all GCF and TCCA Members, and meets monthly via web-conferences



The MCSWS launched the MCX UE & Client Conformance Certification Programme in June 2024

GCF Policies & Procedures for MCX Certification

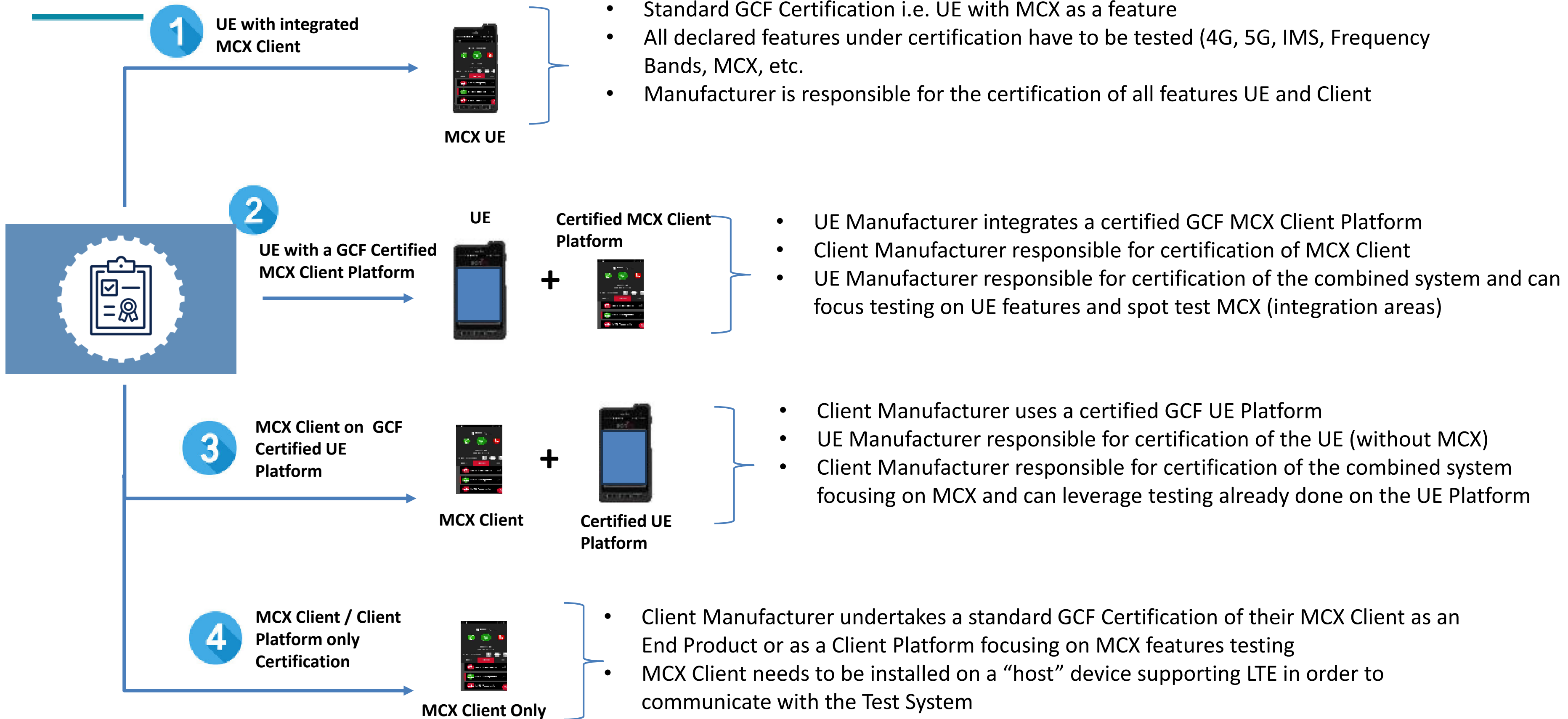


GCF MCS PRD V3.0.0

- A dedicated MCS Permanent Reference Document (PRD), **GCF-MCS V3.0.0**, is available to capture specific certification requirements, policies & procedures
- 4 routes to certification:
 1. **Native Integration of an MCX Client on an End Product → Standard GCF Certification**
 2. **Integration of a GCF Certified MCX Client Platform on an End Product**
 3. **Integration of an MCX Client on a GCF Certified device platform**
 4. **MCX only Client Certification**
- Dedicated Annexes covering the latest test cases:
 - GCF-CC Annex F4.9 MCS Conformance Test List
- Change Requests completed to existing PRDs to accommodate MCX Certification:
 - GCF-CC Annex F2 Update to incorporate MCX features
 - GCF-AP to capture specific procedures applicable for MCX
 - GCF-OB to allow AMM II members to certify MCX Clients & Client Platforms
 - GCF-AD to define SW Clients as an End Product

Routes to Certification

The full process is outlined in the GCF MCS PRD:
<https://mcsws.globalcertificationforum.org/documents/reference-documents.html>



MCS Product Certification Latest Status

What we have so far...


- **Certification Scope:** 3GPP Rel-14 MCPTT Conformance Testing
- **First Test Platform to be Validated:** CMX500 from Rohde & Schwarz
- **First Product to be Certified:** MissionX Android SDK Client Platform from Frequentis AG
- **First Recognised Test Organisation (RTO) for MCS:** AstaZero AB
- **First Assessment Capable Entity (ACE) for MCS:** Ericsson AB
- **First Mission Critical Communications Operator (MCCO) Member:** The Swedish Civil Contingencies Agency, MSB
- **List of MCX Certified Products:**
<https://www.globalcertificationforum.org/gcf-certified-products/all-mcs-certifications.html>



MCS Certification Testing Scope




Conformance
(Active)

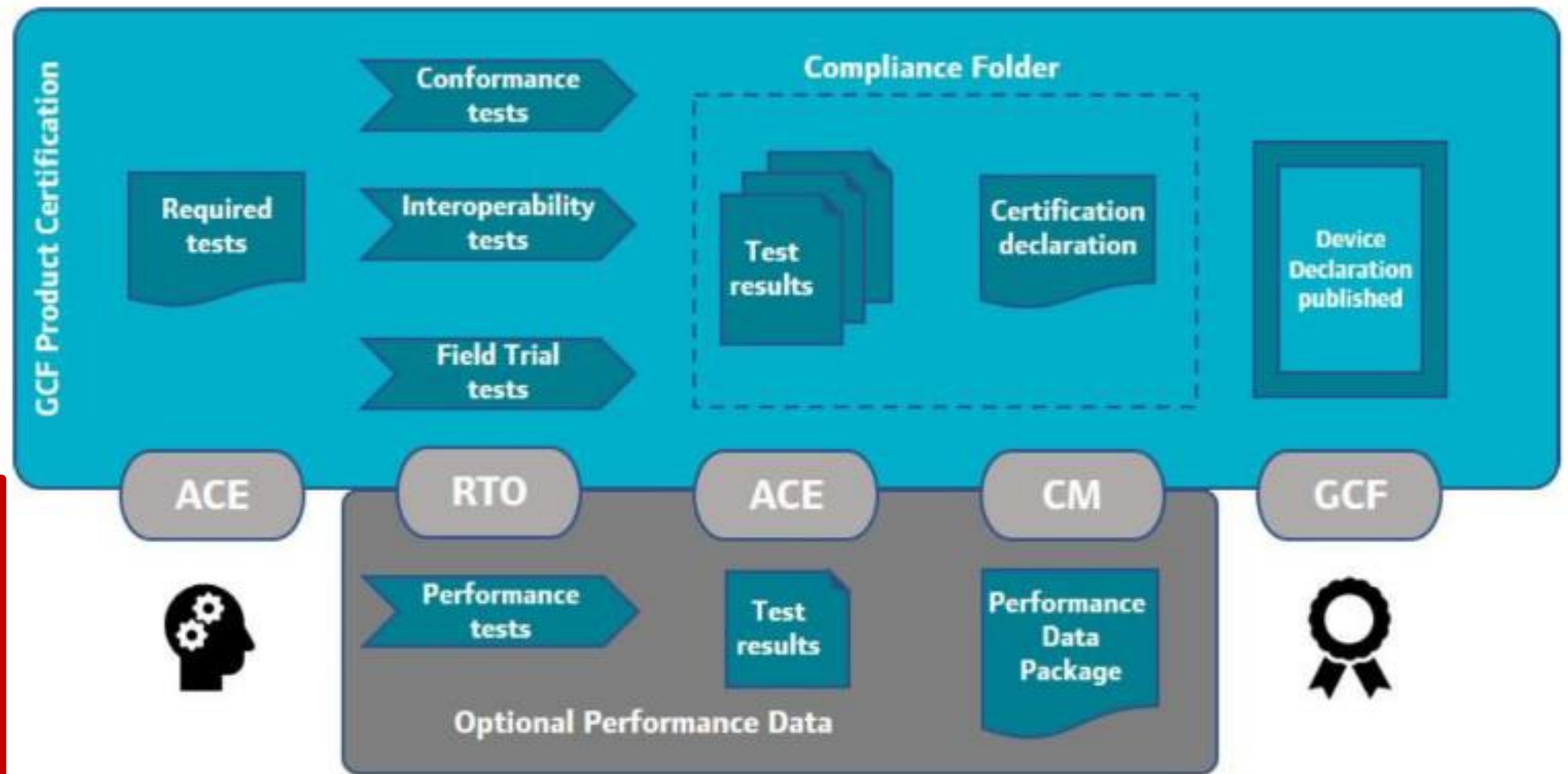


Interoperability
(In Progress)

OR



Field Trials
(In Progress)

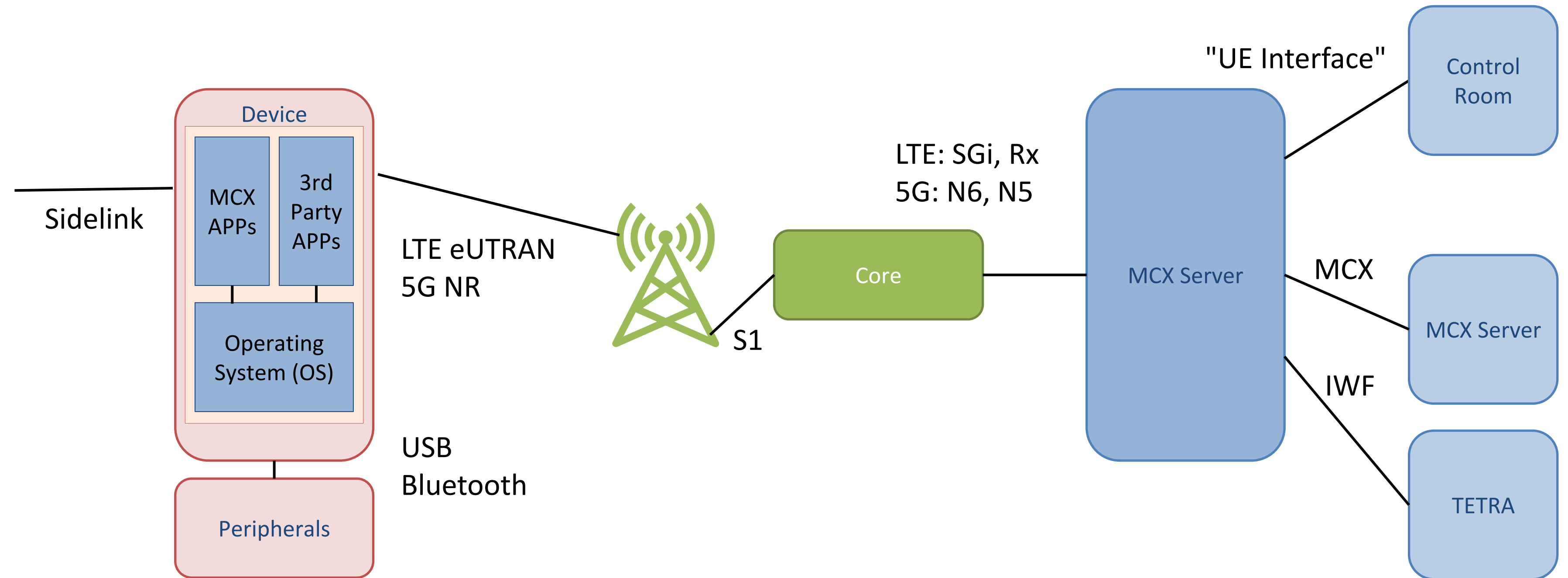


On Demand by
Mission Critical
Operators

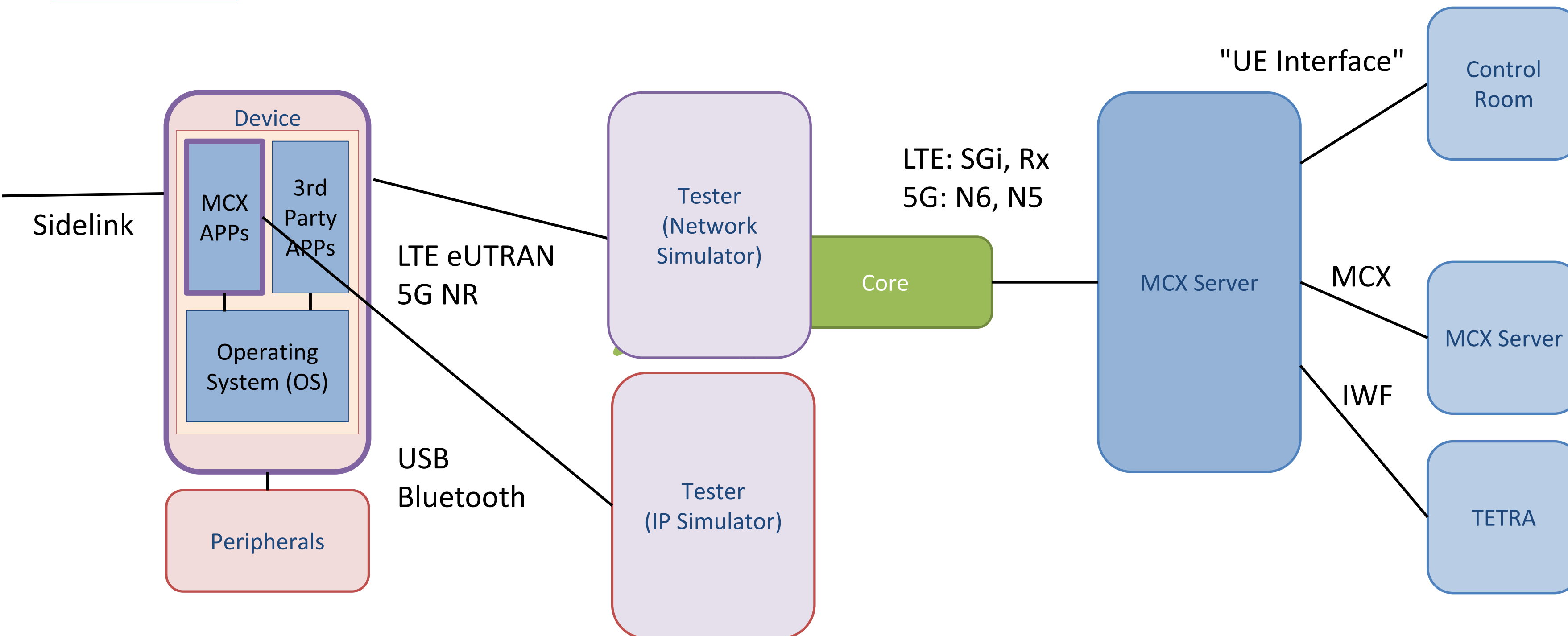


Performance
(Future)

Mission Critical Broadband System

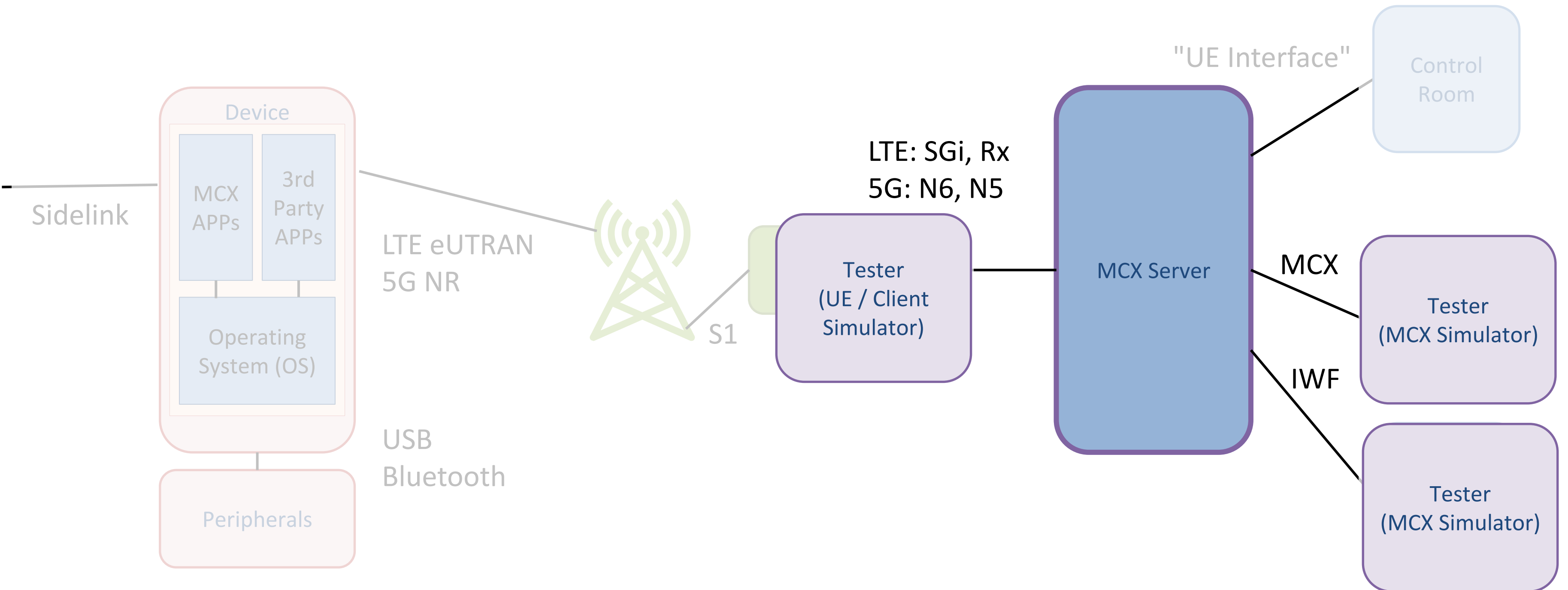


MCX Client & UE Conformance Testing (Active)



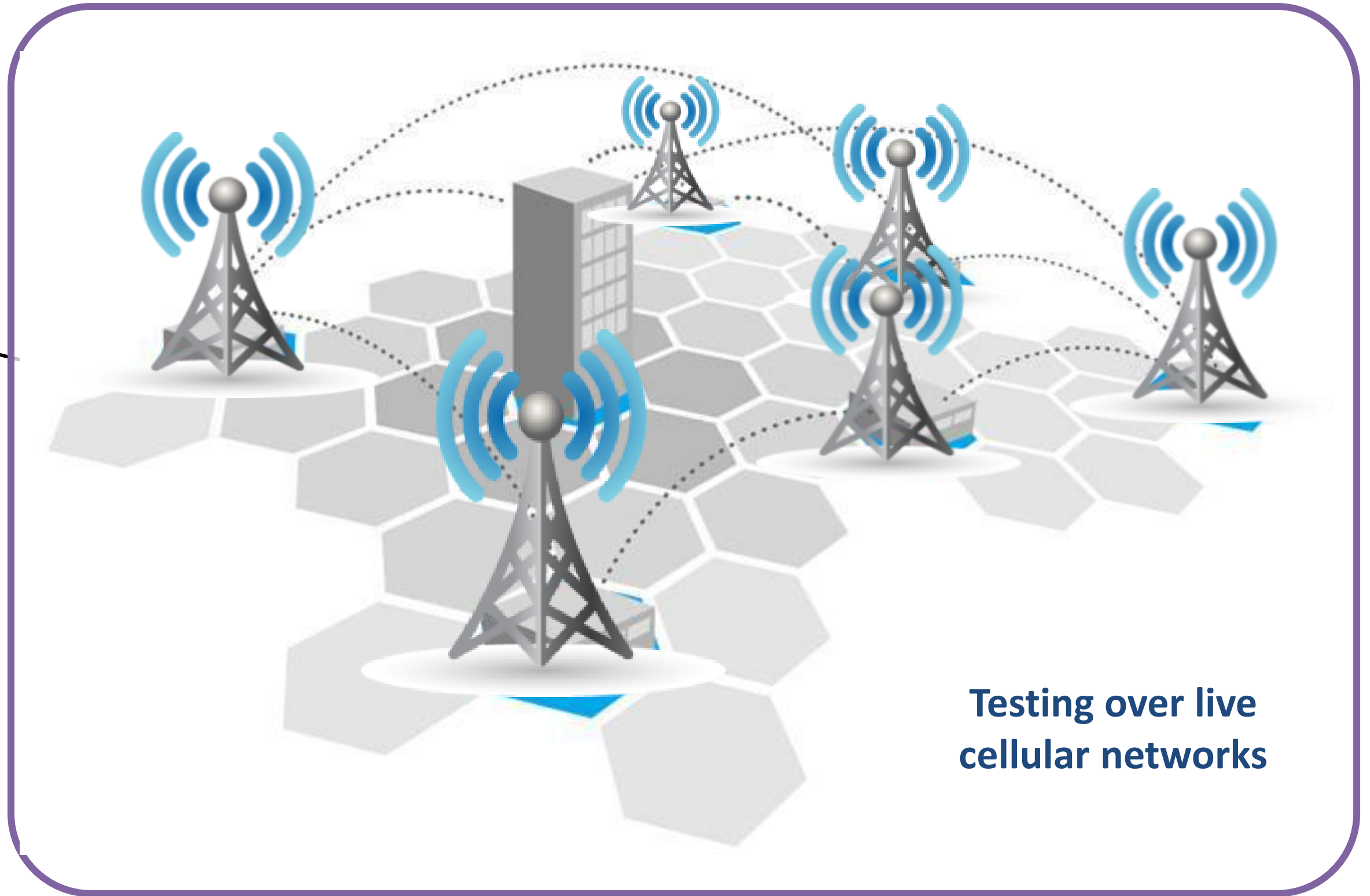
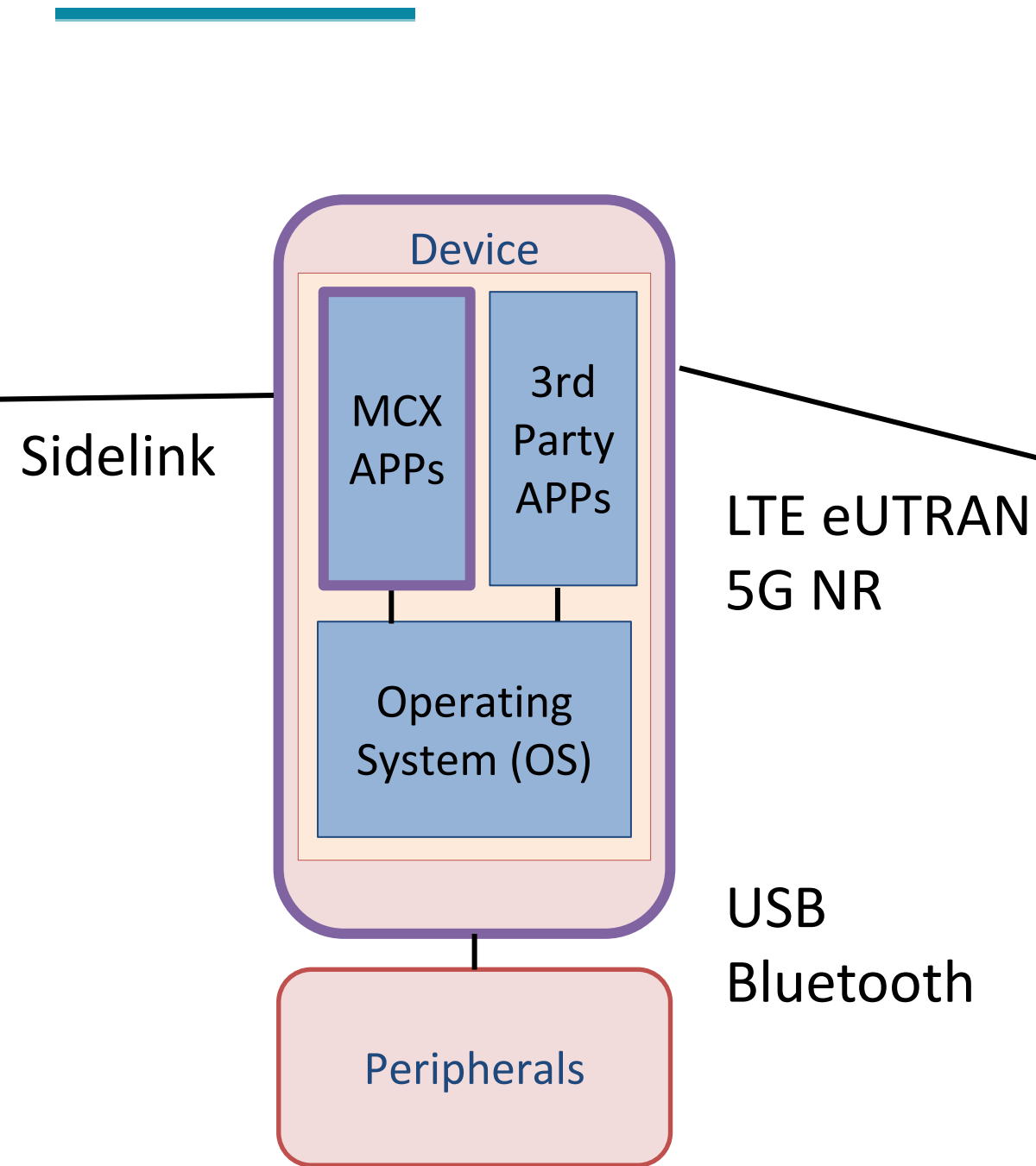
Testing based on 3GPP TS 36.579-x

MCX Server Side Conformance Testing (Potential Future)



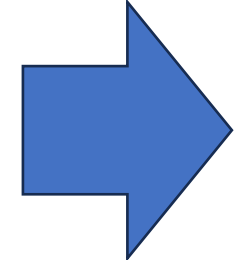
GCF is investigating extending its certification regime to cover server-side products

MCX Field Trials Testing (In Progress)



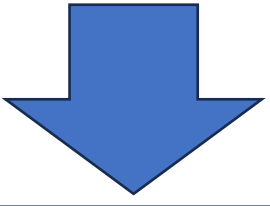
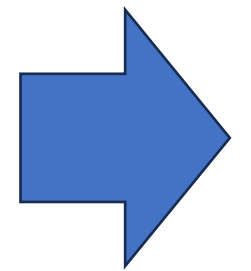
MCX Interoperability Testing (In Development)

- C** Conformance tested
- I** Interoperability tested



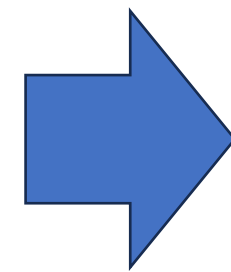
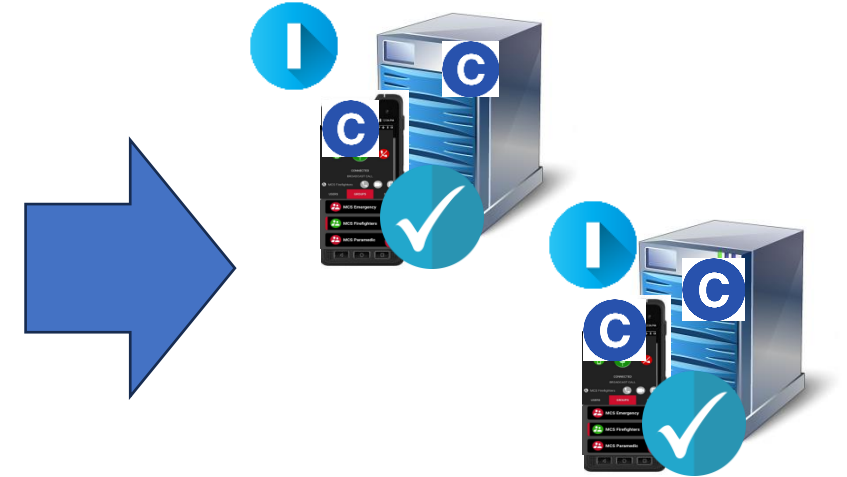
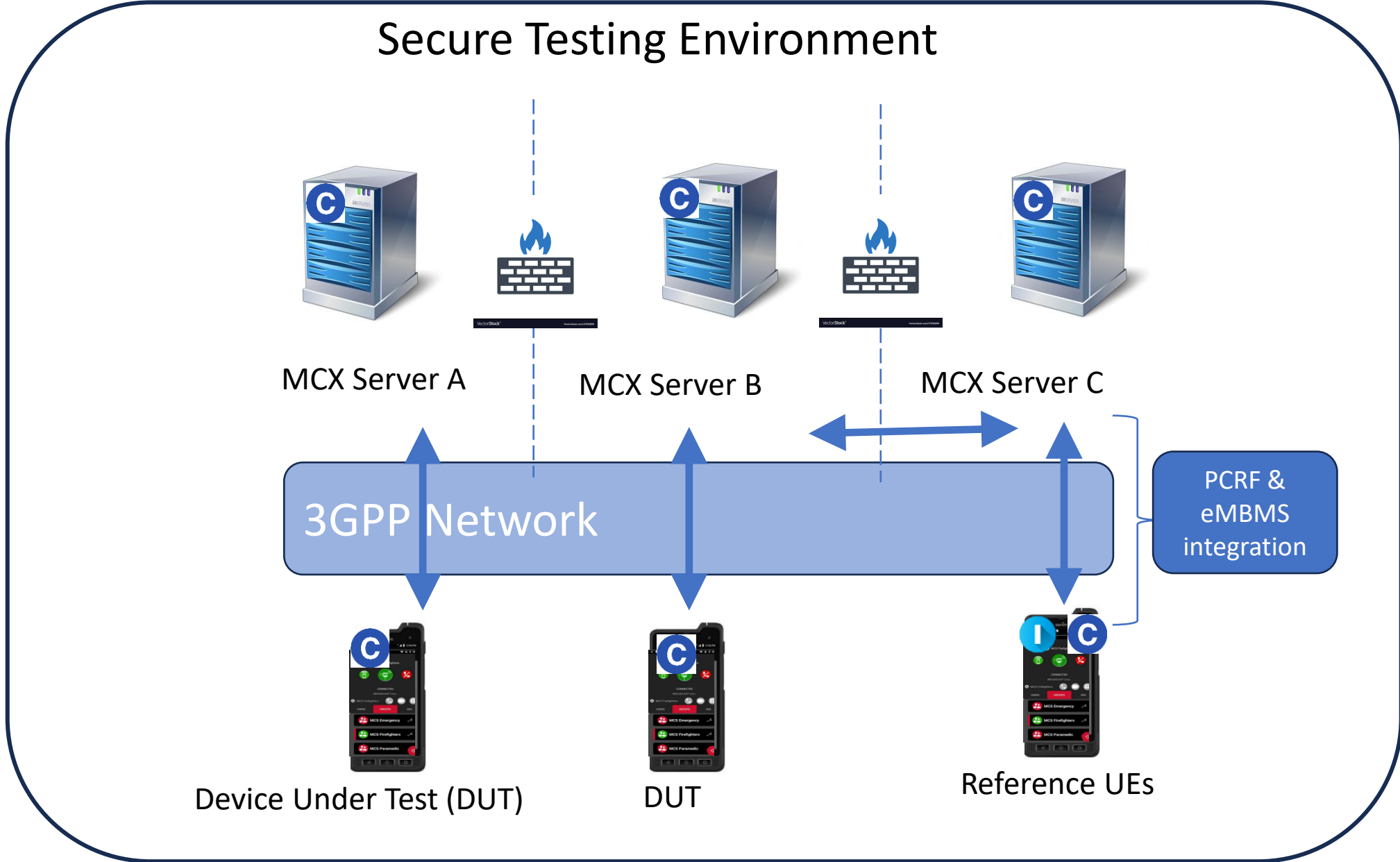
Pre-requisites/Inputs:

- C** GCF Conformance Tested Clients/UEs
- GSMA TS.11 Annex N Test Specifications



Prerequisites/Inputs:

- C** Conformance Tested MCX Servers



Output:

- IOP Tested Combination types:
 - client-server
 - client-server-client
 - server-server combinations
- Testing against already Conformance and Interoperability tested client/UEs and servers
- Minimum number of server combinations to be determined by MCSWS (1, 2, 3, etc.) in a phased approach

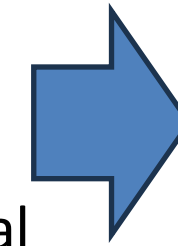
Customers Requesting Certification

Market Dependencies...



Customers requiring certification from their suppliers

- The key driver for the adoption → market **demanding** it and **requiring** it for products
- MCCO's play a key role in demanding their suppliers to provide and to procure certified products & solutions
- GCF, TCCA and the Public Safety Operator community are driving this forward in two ways:
 1. **Certification requirements in legal procurement texts:** TCCA Legal and Regulatory Working Group (LRWG) maintains a library of legal texts that Public Safety Operators can use when tendering contracts. The MCSWS is working to finalise the recommended texts to be used
 2. **Public Safety Operators are encouraged to join GCF as a Mission Critical Communications Operator (MCCO) Member:** The GCF has created a dedicated membership category for Public Safety Operators to join GCF, and actively engage in the operations of the certification programme



Public Safety are updating their contract tenders to include requirements for GCF MCX Certification.

MSB Sweden has joined GCF as the first Mission Critical Communications Operator (MCCO) member with others in the pipeline

Phase 1 MCX Testing Roadmap

- ✓ WI-288 Rel-14 MCPTT Conformance Testing – IPCAN
- ⚙️ WI-288 Rel-14 MCPTT Conformance Testing – EUTRA
- ⚙️ WI-330 Rel-15 MCPTT Conformance Testing
- ⚙️ WI-328 Rel-14 MCVideo Conformance Testing
- ⚙️ WI-331 Rel-15 MCVideo Conformance Testing
- ⚙️ WI-320 Rel-14 MCDData Conformance Testing
- ⚙️ WI-332 Rel-15 MCDData Conformance Testing
- ⚙️ WI-322 Mission Critical QoS Class Indicator (QCI) Conformance Testing

Development completed. Dependencies for activation in certification is **validation of test platforms** for the remaining technology areas, which is driven by service adoption in the market!

Legend:





- ✓ Completed Items
- ⚙️ Items in progress
- ! Items on hold
- ? Potential Roadmap Items

Phase 2 MCX Testing Roadmap

-  MCX Interoperability (IOP) Testing → Design & Development Underway
-  MCX Field Trials Testing → Design & Development Underway
-  MCX Server Side Conformance Testing → Initial Business Planning Underway
-  MCX Performance Testing → Initial technical assessment underway
-  Rel-16 MCX Conformance Work Items → Initial technical assessment underway
-  MCX Off-network over 5G (MC Services over 5G Prose) → Awaiting 3GPP Development

Phase 2 Items are currently in the investigative or design stage and will be brought forward as development gets completed

Legend:

-  Completed Items
-  Items in progress
-  Items on hold
-  Potential Roadmap Items

MCX Conformance Test Roadmap

* Needs to be brought in by 4 Full Supporting GCF Members



TCCA

TCCA: MCX Off-network over 5G (MC Services over 5G Prose)

TCCA: Research Project on MC Services over 5G Prose being done by TAMU, MSB and Qualcomm

3GPP

RAN5: MCX-Rel16 Enhancements (UID-970077) -> Tgt completion Sept 24

RAN5: MCX-Rel17 & Rel-18 Enhancements (not confirmed)

ETSI: Server Side Test Case Development

RAN5: Updates to ToR for Server Side Conformance Testing

RAN5: Server-Side Conformance Testing WI (expected)

TF160: MCX-Rel14 & 15 TTCN Verification Activity

TF160: MCX-Rel16 Enhancements TTCN Completion

TF160: MCX-Rel 16 TTCN Verification Activity

GCF

MCSWS: MCX Server Side Certification Business Plan (tgt SG#101)

MCSWS: MCX Rel-16 Test Case Prioritisation for submission to CAG

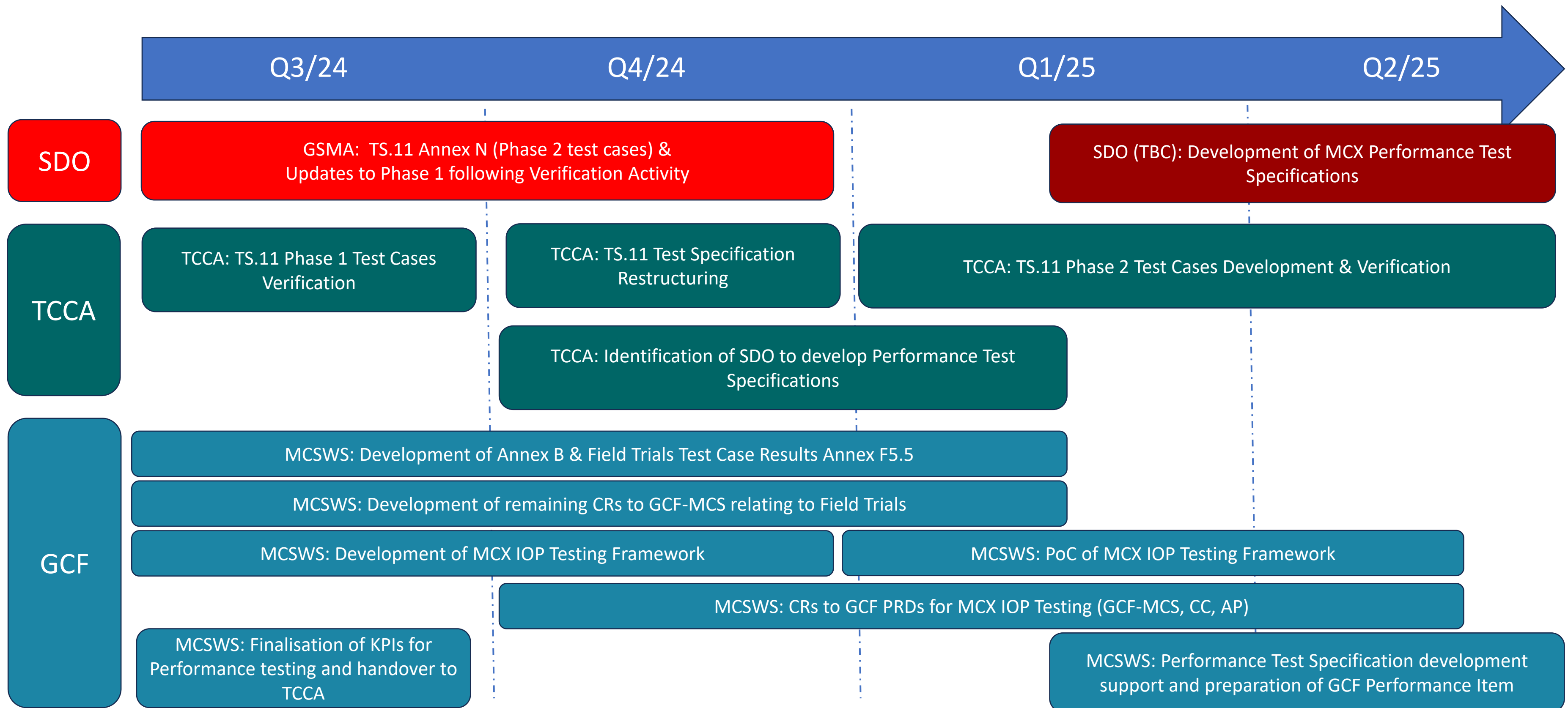
SG: WIP for MCX-Rel16 @ SG#101*

CAG: WID for MCX-Rel16 @ CAG#81 Jan 2025

CAG: TPV for MCX-Rel 14 MCPTT EUTRA, MCVideo & MCDData (IPCAN & EUTRA)

CAG: TPV for MCX Rel-15 MCPTT, MCVideo & MCDData IPCAN & EUTRA

MCX Field, IOP & Performance Test Roadmap



Future Broadband Support for MCX

12 month Rolling Roadmap (2024-2025)

3GPP Technology Areas Supported Today (up to Release 17):

- 5G NR Non-Standalone (NSA) Option 3
- 5G NR Standalone (SA) Option 2, 4
- 5G NR Light RedCap
- 4G LTE Maintenance (FDD/TDD)
- LPWA: NB-IoT, CAT-M
- Legacy: UTRAN, GERAN

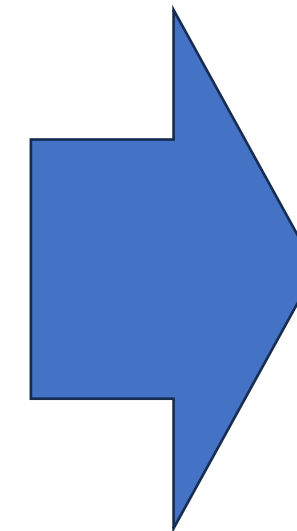
GCF Work Item Coverage:

- RF, RRM, Protocol,
- Demod, CSI, AS & NAS Protocols
- IMS, Positioning, USIM/USAT
- FR1 & FR2 support
- 5G Carrier Aggregation Band Combinations
- 5G EUTRA NR Dual Connectivity (ENDC) & NR EUTRA Dual Connectivity (NEDC)
- 5G NR Voice
- 5G Self Organising Network (SON)
- 5G Minimisation of Drive Test (MDT)
- 5G NR URLCC
- 4G FDD/TDD, Carrier Aggregation, VoLTE, ViLTE, MBMS, PSM, EDRX
- Location: SUPL, GNSS, ECID, OTDOA
- OTA Antenna Tests, USIM/USAT, Consumer eSIM/RSP, etc.

24 month Rolling Roadmap (2025-2027)

3GPP Pipeline (Release 18+):

- 5G Advanced
 - Enhanced NTN support
 - Enhanced IoT and Machine Type Communications
 - Sidelink, Proximity, Location & Positioning
 - Industrial IoT
 - Network Slicing
 - Multicast and Broadcast Services (MBS)
 - Uncrewed Aerial Vehicles
 - Energy Efficiency
 - Artificial Intelligence (AI) & Machine Learning (ML)
 - Extended, Augmented and Virtual Reality & Immersive Communications
 - Ambient IoT
- Work Items to be brought in by members



MCS Device Types & Functionality

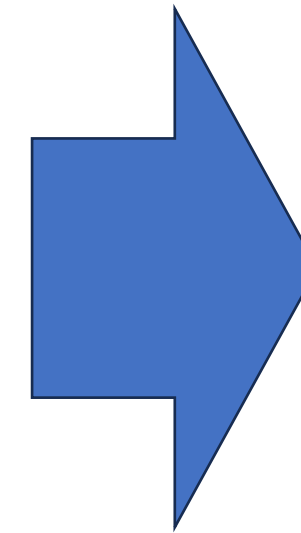


MCS Products Certified Today:

- MCX Clients
- MCX Client Platforms
- MCX Ruggedized Devices

MCS Functionality Covered Today:

- **MCPTT, MCVideo & MCDData (Rel 14 & 15)**
 - Private Calls
 - Group Creation & Affiliation
 - Group Calls, Chat Group Calls
 - Broadcast Group Calls
 - Location Information Support
 - EMBMS
 - QoS, Priority and Pre-emption (QPP)
 - Pre-established & on Demand Sessions
 - Short Data Service (SDS)
 - File Distribution & Video Streams



MCS Products Certified Future:

- Drones & other MCX IoT
- MCX Servers
- Control Room Clients & Interfaces

MCS Future Functionality in collaboration with TCCA:

- **MCX 5G Proximity Services (ProSe/Sidelink)**
- **MCX Performance KPIs**
- **Non-3GPP MCX Access**
- **Interworking Function with TETRA**



Thank you for your attention

asif.hamidullah@globalcertificationforum.org

www.globalcertificationforum.org



Test. Measure. Innovate

THANK YOU
VERY MUCH

ROHDE & SCHWARZ

Make ideas real

