

Trusted Connectivity Alliance Recommended 5G SIM

July 2021

About Trusted Connectivity Alliance



Trusted Connectivity Alliance is a global, non-profit industry association working to enable trust in a connected future.



Our vision is to **drive the sustained growth of a connected society** through trusted connectivity which protects assets, end user privacy and networks.



Our members are leaders within the global **Tamper Resistant Element (TRE) ecosystem**.



A **TRE** is a standalone secure element or secure enclave, consisting of hardware and low-level software providing resistance against logical and physical attacks, capable of hosting secure applications and their confidential and cryptographic data, and are available in removeable, embedded and more recently, integrated form factors (e.g. **SIM, eSIM and integrated SIM**).

Our Membership

Founding:



Founding members of the TCA alliance, arranged in a horizontal line from left to right: Giesecke+Devrient (Creating Confidence), IDEMIA (augmented identity), ST (life.augmented), THALES, and VALID.

Executive:



Executive members of the TCA alliance, arranged in a horizontal line from left to right: Kigen and NXP.

Full:



Full members of the TCA alliance, arranged in two rows. The first row contains: CARD CENTRIC (CARD CENTRIC SOLUTIONS LTD.), EASTCOMPEACE (东信和平), KONA i (KONA international), and Linxens (crafting the future of connections). The second row contains: Qualcomm, Watchdata, WORKZ, and TANYU.

Ordinary:



Ordinary member of the TCA alliance: COMPRION.

Why Trusted Connectivity Alliance?

We work together to:

- Advance and advocate the trust and security credentials of TREs.
- Standardise and enhance the TRE ecosystem to support the evolution of cellular connectivity (e.g. 5G and IoT).
- Promote innovation and growth opportunities TRE offers across markets.



In 2021, we are focused on the following strategic initiatives:

- Ensuring eSIM interoperability and expanding benefits to more IoT use-cases.
- Leveraging SIM technology for IoT security, including continued collaboration with GSMA on IoT SAFE.
- Evolving and optimising 5G SIM technology to enhance 5G network services.
- Highlighting the importance of subscriber privacy in 5G.
- Promoting consistency across integrated SIM technologies.
- Enhancing the TRE market monitoring process to deliver industry-leading insight.

Recommended 5G SIM

What is the TCA Recommended 5G SIM?

- The SIM / eSIM is the only platform which can be used to secure 5G network access according to 3GPP – the 5G standardisation body.
- TCA first defined the Recommended 5G SIM in December 2018 to outline which technical features of SIM technology address the challenges MNOs face, beyond network access, when migrating to 5G.
- The technical definition has now been enhanced to align with new use cases introduced by 3GPP's Release 16 Specifications for 5G Phase 2.



Momentum builds for 5G SIM



2020
marked the
first year of
widespread 5G
SIM
deployments.



The 5G SIM promotes the highest levels of security, privacy and functionality in 5G networks to support key use-cases:

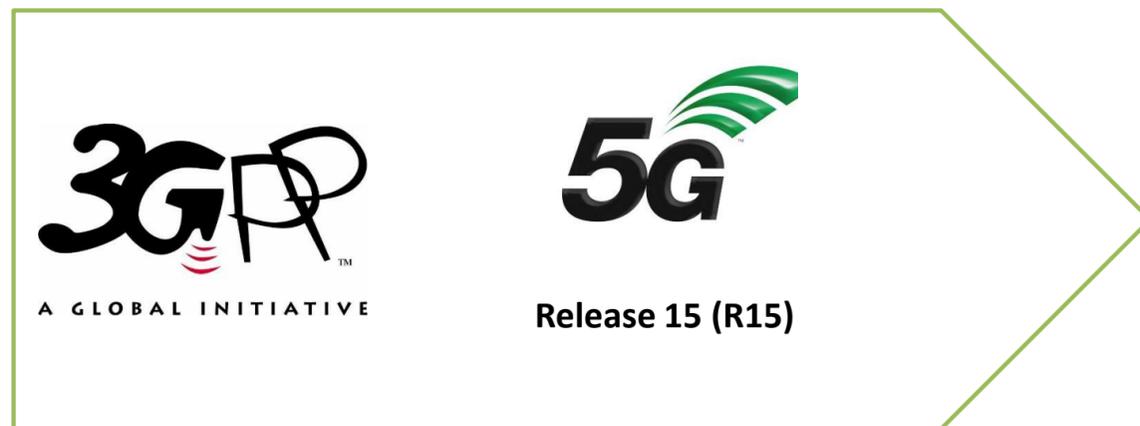
- ***Connected vehicles***
- ***Enhanced mobile broadband***
- ***Massive IoT applications***
- ***Critical communication infrastructures***



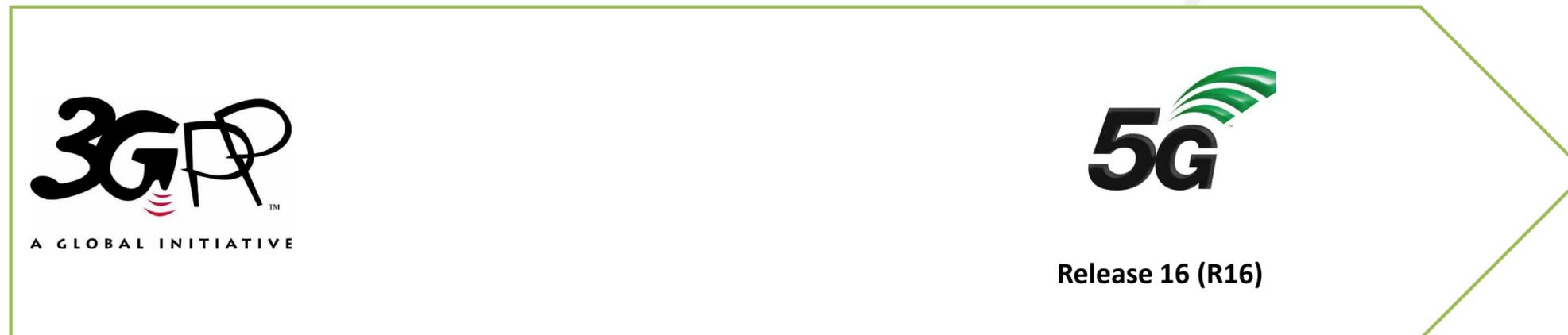
Enhancing the Recommended 5G SIM



- In the same way that network core architecture is evolving, SIM technology is transforming to meet new challenges and opportunities introduced by 5G
- The latest updates respond to powerful new features introduced by 3GPP Release 16 for 5G Phase 2
- The guidance provided in the technical document relates to both 5G Phase 1 (3GPP Release 15) and 5G Phase 2 (3GPP Release 16). The TCA Recommended 5G SIM is fully backwards compatible.



**Release 15 5G
SIM**



**Recommended
5G SIM**

Enhanced Recommended 5G SIM – What's New?

- 1 Private Network Access
- 2 Enhanced Subscriber Privacy
- 3 Cellular V2X Communication
- 4 Improved Mobile Experience

Opportunity

- 5G is driving rapid growth in private network deployments.
- Operators can dedicate part of the 5G public network to address market demand.
- Key use-cases include 5G private networks dedicated to campuses and industrial districts, as well as industry 4.0 and factory automation.

How the Recommended 5G SIM helps

- Delivers the same connectivity and privacy experience as for public networks.
- Prevents fragmentation of device management solutions.
- Ensures support across the different options for installing private 5G networks standardised in 3GPP Release 16:
 - SNPN (Standalone Non-Public Network)
 - PNI-NPN (Public Network integrated Non-Public Network)
 - Wireless / Wireline network convergence.

Opportunity

- 5G presents an opportunity to protect the most prominent personal data involved in mobile communications, the Subscription Permanent Identifier (SUPI).
- The SUPI is known as the IMSI in 2G, 3G and 4G network technologies, and subscriber privacy protections were introduced in 3GPP Release 15.
- 3GPP Release 16 enhances subscriber privacy protections for non-IMSI credentials.

How the Recommended 5G SIM helps

- Allows MNOs to directly configure information to assure 5G network authentication.
- Also enables MNOs to directly manage SUPI concealment for private networks.
- Defines support for the different subscriber identifiers specified in 3GPP Release 16 to address private 5G networks.
- Reduces backward compatibility and interoperability issues.

Opportunity

- 5G improves Cellular V2X (C-V2X) technology through lower latency, greater responsiveness, higher reliability, and wider bandwidths.
- Those features enable the deployment of several services based on 5G connectivity.
- Key use-cases include road safety, traffic management and efficiency, and infotainment and business.

How the Recommended 5G SIM helps

- Supports V2X communication configuration.
- This addresses market fragmentation across different operating systems to ensure consistent V2X functionality.

Opportunity

- Roaming fees remain an important revenue generator for MNOs and this is still considered as a priority in 5G.
- Ensuring roaming policies are applied reliably is also crucial to an optimised user experience.
- Traditional solutions are showing technical limitations, creating the potential for a significant loss of revenue.
- 5G Release 16 introduces new standardised Steering of Roaming.

How the Recommended 5G SIM helps

- Enables a new Steering Of Roaming service (SoR) in 5G Standalone (SA) networks.
- This removes technical drawbacks to guarantee the confidentiality and integrity of sensitive business agreements and improve quality of service.

Opportunity

- Network slicing enables MNOs to meet the demands of different use case requirements.
- Each network slice is designed to serve a defined business case, creating revenue generation opportunities and cost-efficiencies.
- Pre-configuration of the device with slice information is essential for customers to benefit from an optimised experience.
- Enhance all network related applications and services using 5G specific information.

How the Recommended 5G SIM helps

- Ensures end user devices are well configured from the very first switch on.
- Provides a standardised, cost-effective solution to store pre-configured network settings.
- User Equipment Route Selection Policy (URSP) determines how to route outgoing traffic.
- Helps avoid complex and device dependent configurations in the highly fragmented 5G ecosystem.
- All SIM-based applications can benefit from 5G toolkit enhancement to benefit from 5G specific parameters.

Improved Mobile Experience – Trusted Non-3GPP Access

Opportunity

- 3GPP Release 16 supports multiple access technologies and the handover between these accesses.
- Non-3GPP refers to access technologies that were not specified within the 3GPP.
- Providing services over non-3GPP technologies delivers various benefits.
- Non-3GPP accesses are split into two categories: "trusted" and "untrusted"
 - For trusted non-3GPP access, MNOs trust and operate the access points on the network, and the credentials are derived from the security context of the network.
 - The trusted access is standardised in 3GPP Release 16.

How the Recommended 5G SIM helps

- 3GPP does not specify which non-3GPP technologies should be considered trusted or untrusted. This decision is made by the MNO.
- Allows MNOs to list which access points can be assumed as trusted access points.
- Ensures MNOs can easily manage and update the list of access points.

Improved Mobile Experience – Multi-device and Multi Identity

Opportunity

- Growing demand for multiple identities to be enabled on a single device, allowing different subscribers to call and message.
- Conversely, sharing a single user identity across multiple devices is particularly beneficial as global connectivity increases.

How the Recommended 5G SIM helps

- Supports Multi-Identity and Multi-Device capability.
- This delivers flexibility to enable multiple users on a single device, and a single user across multiple devices.

Key Conclusions

The Release 15 5G SIM originally recommended by TCA included technical features which **addressed the many challenges, beyond network access, faced by MNOs as they migrated to 5G networks.**

Momentum is now building across the industry for **5G Phase 2 deployments.**

TCA strongly advocates for the adoption of the enhanced Release 16 Recommended 5G SIM as it will enable MNOs to **unlock the full potential of 5G networks.**



Download the paper at:
www.trustedconnectivityalliance.org



Thank You

For more information, please contact:
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