

# Thales High Speed Encryptors Delivering on the Promise of 5G



## Introduction

The fifth generation cellular network, 5G, delivers data transfers up to 100 times faster than 4G, and supports millions more devices without loss of service, with improved coverage and reliability. Expected to transform verticals such as manufacturing, oil and gas, mining, shipping and more, 5G connectivity brings new capabilities such as IoT, virtual reality, gaming, remote surgeries, real time mass-data updates for mobile devices, connected cars, sensors, etc. 5G users will benefit from more connections, with fewer drops and less interference while enjoying remote access from almost anywhere. While 5G creates extraordinary opportunities for people and businesses, it also introduces unique technical and security challenges.

## 5G and the data explosion

The introduction of 5G networks presents unparalleled challenges for securing data in motion. With higher speeds and expanded network capacity of 5G, there will be more data in motion than ever, this is undeniable and network architectures are being designed to meet the demand. According to Ericsson's Mobility Report 2022, mobile consumers devour an estimated 90 exabytes a month, aka 90 billion gigabytes! However, this number is projected to reach 325 EB per month in 2028.

This data explosion needs to be secured efficiently and to the highest commercial standards throughout the network but

particularly from the RAN to the edge data center and back to the core of the network where mass amounts of data will be aggregated and moved in large scale. The more data we push, the more harvest and decrypt attacks become worthwhile to hackers. Data injection, misdirection and capture are real threats, and the more data that flows through the network the more likely we are to see large scale surveillance and collections programs. The underlying trust to the 5G network will be critical for widespread adoption.

As 5G scales out, adding more connectivity and capacity to the network, it will allow for greater simultaneous interactions and more data at higher speeds flowing to the edge. In addition to reduced speeds and capacity issues, the processing of legacy encryption can slow down the network by increasing latency and jitter. Latency budgets can be 1 milli-second or less. Poor performing legacy encryption solutions can chew up a large portion of a 5G networks latency budget. Increased latency and jitter wreak havoc on real time applications and can cause poor user experience in areas of IoT, voice and video, and render some advancements such as remote surgeries impossible. To deliver on the promise of 5G and the applications that will advance the world the network needs high capacity and low latency. This is only possible with efficient bandwidth utilization and the ability for the underlying systems to be able process data without latency. Bottom line, 25-year-old security solutions, such as IPsec, MACsec and VPN, no longer meet the security and performance requirements for next generation 5G networks.

# Thales High Speed Encryption for 5G

Thales High Speed Encryption (HSE) solutions are equipped with Transport Independent Mode (TIM), a new approach that allows encryption over any network (e.g. layer 2, layer 3 or 4). TIM allows for easy movement between layers, and meets the 5G requirements for quantum-ready security, low jitter and low latency at up to 98% network efficiency.

TIM offers tunnel-less encryption, eliminating the complexity of legacy encryption and also offering the ability to concurrently encrypt at Layers 2, 3 and 4, providing flow and route diversity and the ability for a moving target defense as attacks are levied at different network layers.

Thales HSE's tunnel-less approach reduces protocol overhead, and allow for bandwidth efficiencies that are mathematically unachievable by the likes of IPsec and MACsec. In addition, the cut-through hardware and software architectures are optimized to perform encryption operations in under 10uS across the product portfolio, leaving the latency budget intact for real time performance without security weaknesses.

The advanced combination of security features and network flexibility make it ideal to support a wide range of modern networks and thwart attacks by providing fully authenticated end-to-end encryption and user controlled key management. HSE crypto agility allows the platform to evolve and update with changing standards and best practices. This allows Thales HSE solutions to meet current and future threats such as quantum computing by supporting PQC algorithms today. HSE offers virtual and hardware encryption appliances that give MNOs, cloud providers and network equipment providers a way to deliver on the promise of 5G through the following:

## Security not available through legacy encryption protocols

- Globally certified encryption to meet all compliance needs
- Tunnel-less, end-to-end authenticated encryption for ease of use and efficiency
- Concurrent encryption at Layer 2,3, and 4
- Route diversity and moving target defense for data in Motion
- Separation of duties, abstracting security from network as an overlay
- Automated key management and updates
- Future-proof solution: Crypto-agile and quantum safe

## Performance to meet 5G

- Efficient bandwidth utilization through minimization of protocol overhead
- Deterministic performance via cut-through hardware and software architecture
- Micro-second latency and negligible jitter

## Flexibility

- Bump in the wire solution for all networks
- Vendor and protocol agnostic
- All switching/routing and QoS preserved

## Thales can help

Contact us to learn how to quickly adapt your infrastructure to meet 5G performance, scalability, speed, cost and privacy requirements, and establish trust for your critical data links.

## About Thales

The people you rely on to protect your privacy rely on Thales to protect their data. When it comes to data security, organizations are faced with an increasing number of decisive moments. Whether the moment is building an encryption strategy, moving to the cloud, or meeting compliance mandates, you can rely on Thales to secure your digital transformation.