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## COMMUNICATE smart!

# Let's Get Ready for LTE!

LTE (Long Term Evolution) is the solution of choice by mobile operators to the market's need for a 4G mobile access network. Driven by the present rapid change in mobile device usage, LTE is helping in the transformation of mobile networks from handling voice calls to being a platform for wireless data communication.

### Why a new generation of mobile networks?

Since the first deployments of analog, automated mobile telephony in the 1980s, new generations of mobile networks have been appearing on the market about every ten years. It was only to be expected that a fourth generation would follow the successful deployment of 3G.

It is the revolution on the mobile device front that drives the need for a 4G net-

work. The arrival of smartphones and USB dongles for data communication, mobile apps, and attractive services such as e-mail, social networking, etc. has triggered an immense need for more and more bandwidth carrying data. Present-day mobile users want a fast and capable network that allows them to profit from all the services offered. But without having to pay more, of course.

The migration towards data-based instead of voice-based services calls for a reaction on the part of mobile operators. Without further development of existing mobile networks, it would not be possible to accommodate all this data as well as the rapid growth of the number of M2M devices that have to be constantly connected and support upcoming NFC technology.

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## PAY smart!

# NFC, Dual Interface, Contactless – Reports from G&D Success Stories

Since the establishment of contactless payment cards in the year 2000, the technology has made a triumphal course worldwide. The success continued with the introduction of dual interface cards for contactless and contact-based transactions.

With Near Field Communication (NFC) technology, the next generation of con-

tactless payment has already begun. NFC technology has been extensively piloted over the last three years and is now being launched commercially.

Whether in Europe, the US or Asia, G&D was able to cooperate with financial institutions and enterprises to drive the adoption of contactless technology forward.

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# Let's Get Ready for LTE!

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## What is LTE?

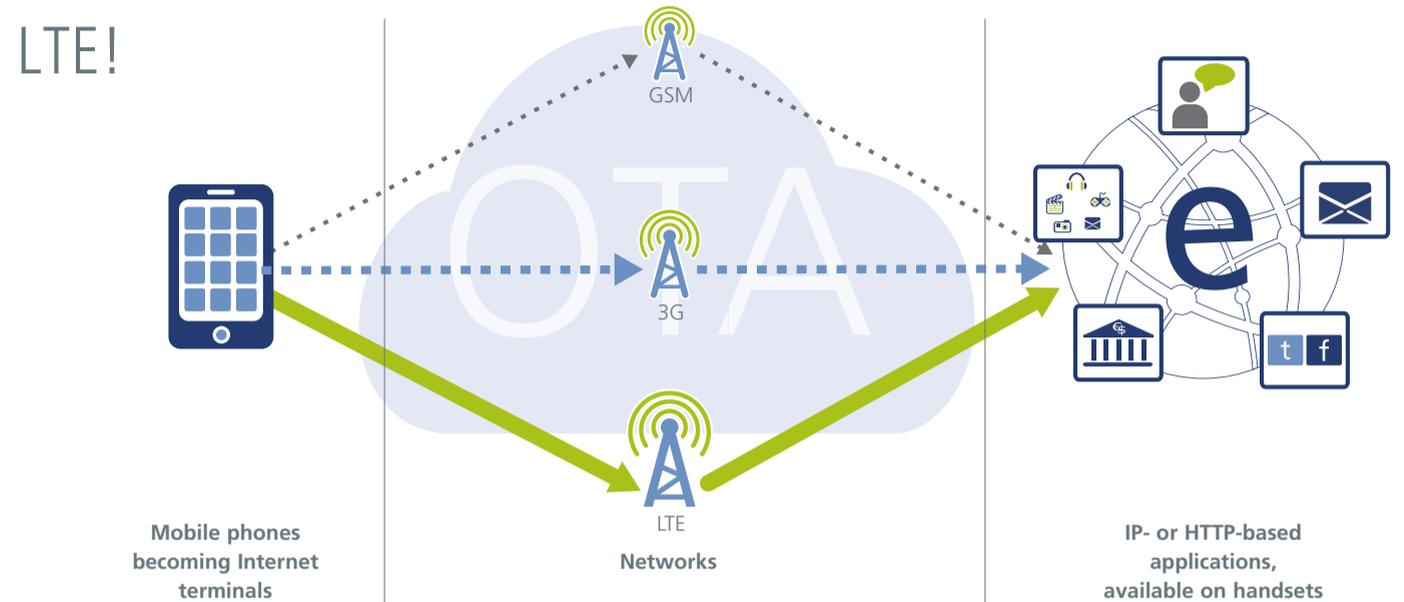
Long Term Evolution, or LTE, is a mobile access network and the fourth-generation (4G) mobile communications standard of 3GPP. LTE enjoys numerous advantages over its predecessors UMTS and HSPA, allowing not only more data transfer but also a greater number of connections per cell to access broadband services. LTE networks require fewer system components and boast sharply reduced latency. All this makes completely new broadband services possible for mobile devices.

LTE must be capable of working in symbiosis with earlier network generations – GSM, CDMA, and UMTS, as these established networks will be in place for many years to come. The SAE core network architecture of LTE will ensure this interoperability. LTE is based on a fully IP-based flat network, which means that the data transfer between network nodes is based on the IP rather than telecom-specific standards. This leads to large savings in investments and operational costs due to fewer network nodes and the re-use of existing commercial IP technology.

## Let's go for LTE!

An investment in LTE for operators is a challenge, as they must make sure that all parts of the system are managed seamlessly. But also, LTE offers many improvements and new possibilities compared to older networks:

- Higher capacity for mobile data, which is an absolute prerequisite for mobile operators to accommodate the rapid revolution on the device front
- Cost advantage: Reduction in investment costs incurred for expanding the network with new data capability, as well as reduction of operational costs once the network is built
- Spectrum flexibility, higher bandwidth efficiency, and the possibility to re-use



existing spectrum licenses will reduce the required investment in expensive licenses and antenna sites

- Different Quality of Service levels for different services such as voice, on-demand video, and multimedia services
- Interworking with former mobile networks to capitalize on earlier investments
- Adoption at international level, and not only in specific regions. LTE devices can be used in any country that implements this technology

## The LTE opportunity

The migration from a voice- and SMS-based paradigm to an all-IP world, and the large investment budgets that are allocated by mobile operators to meet these new requirements, constitute a window for introducing new, innovative SIM-based solutions.

The SIM card or the UICC (Universal Integrated Chip Card) will continue to serve as the mandatory element for authentication in LTE (as specified by 3GPP). It will also be the decisive element for identifying the user in former mobile networks. But beyond pure authentication, it will offer several technologies such as NFC, SCWS, Mobile Wallet, and others. With a smart combination of these technologies, the MNO will be able to develop new

attractive value added services that will be under the MNO's control.

When it comes to the OTA server side, we see a strong trend where mobile operators are upgrading the traditional SMS bearer of their OTA platforms with a capability to do remote management via wireless IP. Driving factors here are the need for more capacity and reliability, partly to improve existing OTA use cases, especially billing-system-initiated subscriber activations, partly when implementing new use cases such as NFC, UICC application management, and M2M.

Of strategic importance is that the OTA platform is agnostic to what radio access technology is used, as subscribers will be spread across different network technologies. Also, it is important that the platform is agnostic of secure element type: it needs to accommodate for the fact that not only UICCs are used but also new secure element types such as micro SD cards, device-embedded secure elements, and trusted environments such as Mobicore.

## The offer from G&D

G&D offers complete solutions for LTE network operators, including LTE-enabled SIM cards, and OTA-based end-to-end solutions including server platform and on-card applications.

The G&D product line will allow the mobile operator to use the wireless IP bearer and the HTTP protocol for remote management of UICCs and other secure elements, across different network access technologies. This builds a solid foundation for implementing compelling use cases such as NFC, M2M, and UICC application management, in addition to extending traditional use cases such as subscriber activation with more features.

The G&D portfolio of SIM applications with HTTP capability is a natural part of any IP-based OTA solution. A SIM applet for subscriber activation is used to activate the subscriber when the handset is first powered on with subscription parameters, roaming parameters, applications, and other data. Using an applet that performs periodic polling, the SIM is able to make sure that the latest content is always present on the card. Mobile operators deploying IP-based OTA have also been seen to deploy applets for managed roaming, SIM-handset lock, device detection, and dual IMSI.

Also, the mobile operator's LTE rollout project is a window for promoting new SIM technology in general. There are several interesting areas, including NFC, M2M, IMS/ISIM, Generic Bootstrap Architecture, SCWS, WLAN access, CSIM and 3GPP/3GPP2 interworking, EAP, and femtocell provisioning. <

## Glossary

<b>3GPP/3GPP2</b>	3rd-Generation Partner Project 1/2
<b>3G</b>	3rd-Generation mobile standards
<b>4G</b>	4th-Generation mobile standards
<b>CDMA</b>	Code Division Multiple Access
<b>CSIM</b>	CDMA Subscriber Identity Module
<b>EAP</b>	Extensible Authentication Protocol
<b>GSM</b>	Global System for Mobile Communications

<b>HTTP</b>	Hypertext Transfer Protocol
<b>HSPA</b>	High Speed Packet Access
<b>IMS</b>	IP Multimedia System
<b>ISIM</b>	International Mobile Subscriber Identity
<b>IP</b>	Internet Protocol
<b>ISIM</b>	IP Multimedia Services Identity Module
<b>LTE</b>	Long Term Evolution network

<b>M2M</b>	Machine-to-Machine
<b>MNO</b>	Mobile Network Operator
<b>NFC</b>	Near Field Communication
<b>OTA</b>	Over-the-Air
<b>SAE</b>	System Architecture Evolution
<b>SCWS</b>	Smart Card Web Server
<b>SIM</b>	Subscriber Identity Module

<b>UICC</b>	Universal Integrated Circuit Card
<b>UMTS</b>	Universal Mobile Telecommunications System
<b>WLAN</b>	Wireless Local Area Network

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