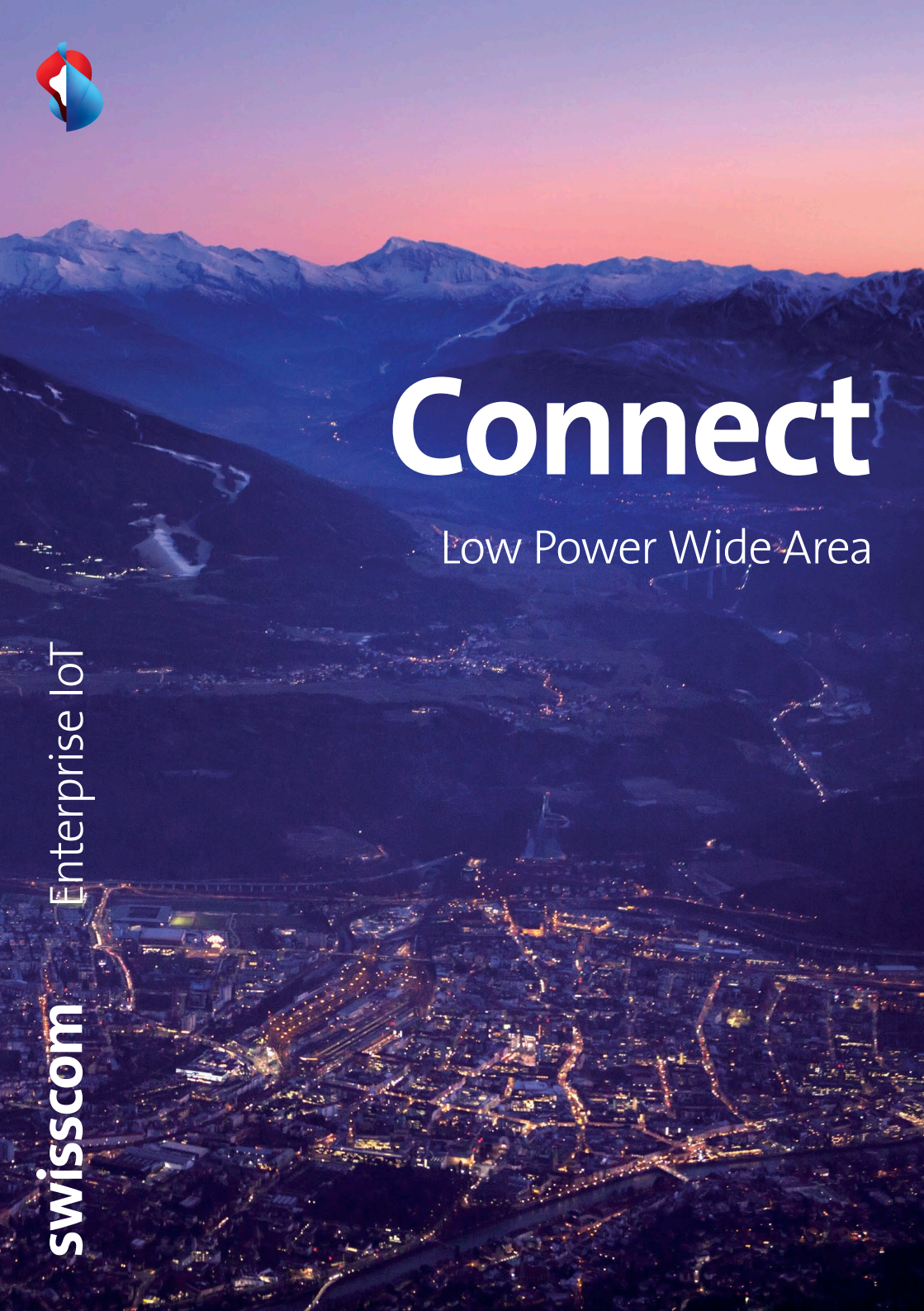
Connect
Low Power Wide Area
swisscom Enterprise IoT

www.swisscom.ch/iot

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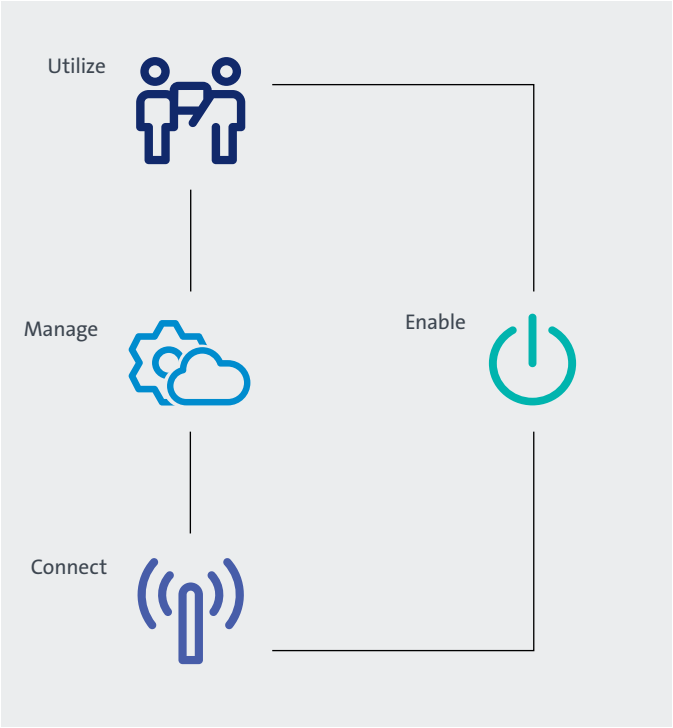
Network technologies at a glance Focus on Low-Power Wide-Area technologies

The Internet of Things (IoT) is a worldwide infrastructure that connects different objects such as meters, surveillance equipment and security systems with each other and with IT applications. Valuable information can therefore be collected, analysed and used. Data management is easier and efficient data transmission drives lucrative business models, automated processes and new types of customer interaction.

Swisscom Enterprise IoT guarantees secure data transmission by providing you with the networks you need for your IoT application. Network requirements vary according to data volumes, range, network coverage and data sensitivity.

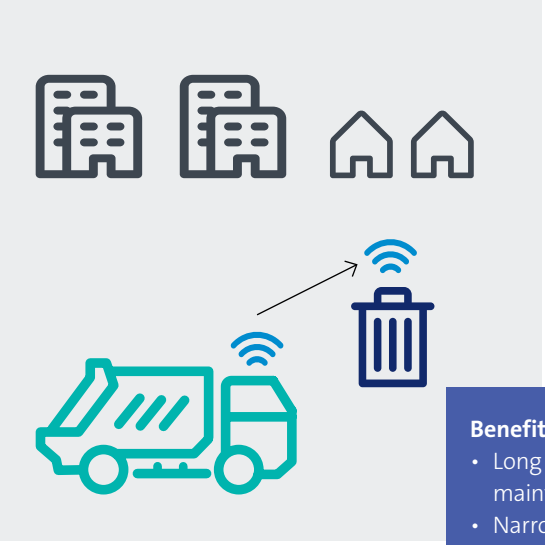
We follow a modular, technology-neutral approach and support all relevant standards such as LoRaWAN, Cat. M1, NB-IoT, 3G, 4G and 5G. With access to efficient IoT technologies, new business cases can be created for every conceivable industry application – whatever type of device or access option is used for your IoT application. Tap into the innovative potential of digitisation with Swisscom Enterprise IoT.

Enterprise IoT



LPN (LoRa)

Smart City



Benefits

- Long battery life with minimal maintenance costs
- Narrow bandwidth means wide range and energy-efficient transmission
- High scalability, low network costs, efficient local expansion
- Suitable for small volumes of data

https://lora-alliance.org/about-lorawan

The Low Power Network (LPN)* is a standalone data network specially created for IoT applications that transmi**t small quantities of data.** The resulting benefits make it possible to create a huge wealth of new IoT networks and digital applications **for private and business customers.**

Most common types of application (massive IoT)

- Smart cities: smart waste management, smart lighting, smart parking
- Smart utilities: remote reading of gas, water and electricity meters
- Smart buildings: meeting room management, connected fire extinguishers and defibrillators, temperature and air quality measurement
- Agriculture: monitoring of weather and plant growth, livestock tracking, soil quality measurement

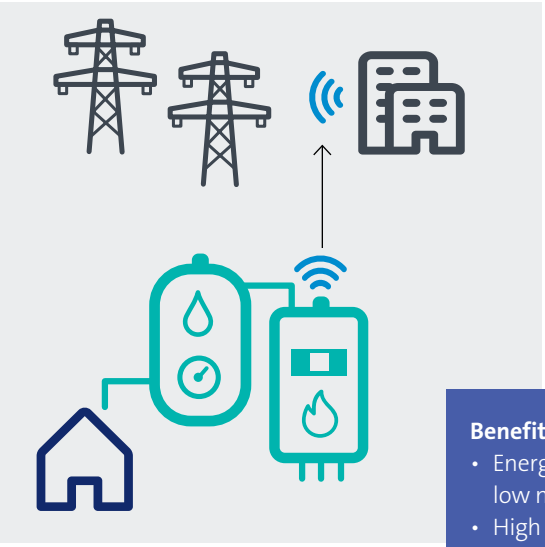
Application example

Temperature and presence sensors in office buildings deliver relevant information that can be used to adapt electricity consumption to current requirements and increase air quality and energy efficiency.

* The wireless network is based on the open LoRaWAN specification

NB-IoT

Smart Utilities



Benefits

- Energy-efficient transmission with low network costs
- High availability, security and reliable data transfer in hard-to-reach locations such as cellars, remote areas and underground
- Suitable for stationary use without power supply
- Suitable for large quantities of devices

http://www.3gpp.org/specifications/releases/

NB-IoT (Narrowband-IoT)* is a special extension of the LTE network (4G network) suitable for l**arge numbers and a high density** of devices and provides **deep building penetration.**

Most common types of application (massive IoT)

- Smart utilities: gas, water and electricity meters, smart grid management
- Industry 4.0: process monitoring and control, heating, ventilation and air conditioning technology
- Wearables: tracking of children and the elderly, animal tracking, remote control of domestic appliances

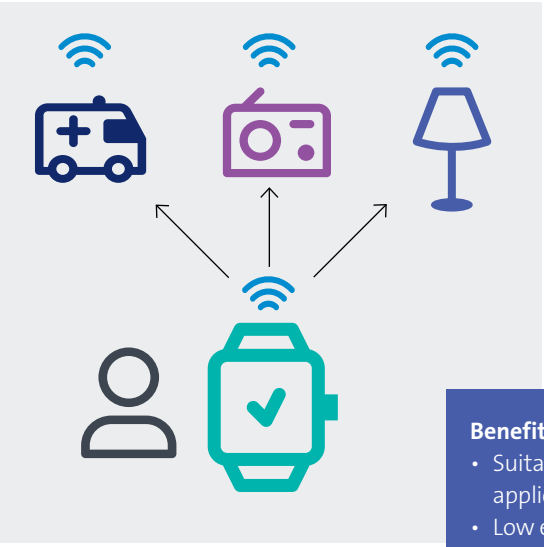
Application example

It is no longer necessary to regularly send an employee into individual buildings in order to see how much energy and water they are consuming each year. Smart meters can do this with the help of sensors and transfer the data automatically to your data centre.

* Cellular mobile network running on licensed spectrum; 4G, 3GPP Release 13

LTE-M (LTE Cat. M1)

Wearables



Benefits

- Suitable for quality-sensitive applications
- Low energy consumption and maintenance costs
- Long battery life, wide range and high security
- Higher data throughput (compared with NB-IoT), supporting software updates

http://www.3gpp.org/specifications/releases/

LTE-M is an extension of the LTE network (4G network)* suitable for **quality-sensitive applications.** This network technology is extremely energy-efficient and also supports mobile cell handover for non-static applications and voice functionalities (VoLTE).

Most common types of application (critical IoT)

- Security and surveillance applications: object and traffic monitoring
- Transport and logistics: fleet management, goods tracking
- Wearables: tracking of children and the elderly, animal tracking, remote control of domestic appliances
- Emergency applications: passenger lifts

Application example

LTE-M is particularly suitable for mobile telemetry systems that require high reliability. These could include voice-controlled emergency wristwatches that need to be able to transmit small data volumes in critical timeframes.

* Cellular mobile network running on licensed spectrum; 4G, 3GPP Release 13

LTE (Cat. 1)

Digitale Signage

Benefits

- Low energy consumption and cost structure
- Scalability on 4G networks
- Suitable for VoIP video streaming
- High data transfer rate and security

http://www.3gpp.org/specifications/releases/

The lowest device category in the existing LTE network (4G network)* is suitable for IoT applications on account of a relatively **low data rate** and yet it offers the necessary speeds for **data streaming.**

Possible types of application (critical IoT)

- Health: health monitoring, remote controlled operations
- Security and surveillance applications: video surveillance, object surveillance, automatic emergency call
- Digital signage: electronic traffic and display signs, information boards, advertising
- Industry 4.0: remote monitoring and control, predictive maintenance

Application example

A potential customer enters a shopping centre and is informed of current promotions on his mobile device via a live stream. Through personalised advertising, potential customers can be reached directly at the point of sale, which makes them more likely to make a purchase.

* Cellular mobile network running on licensed spectrum; 4G, 3GPP Release 8

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