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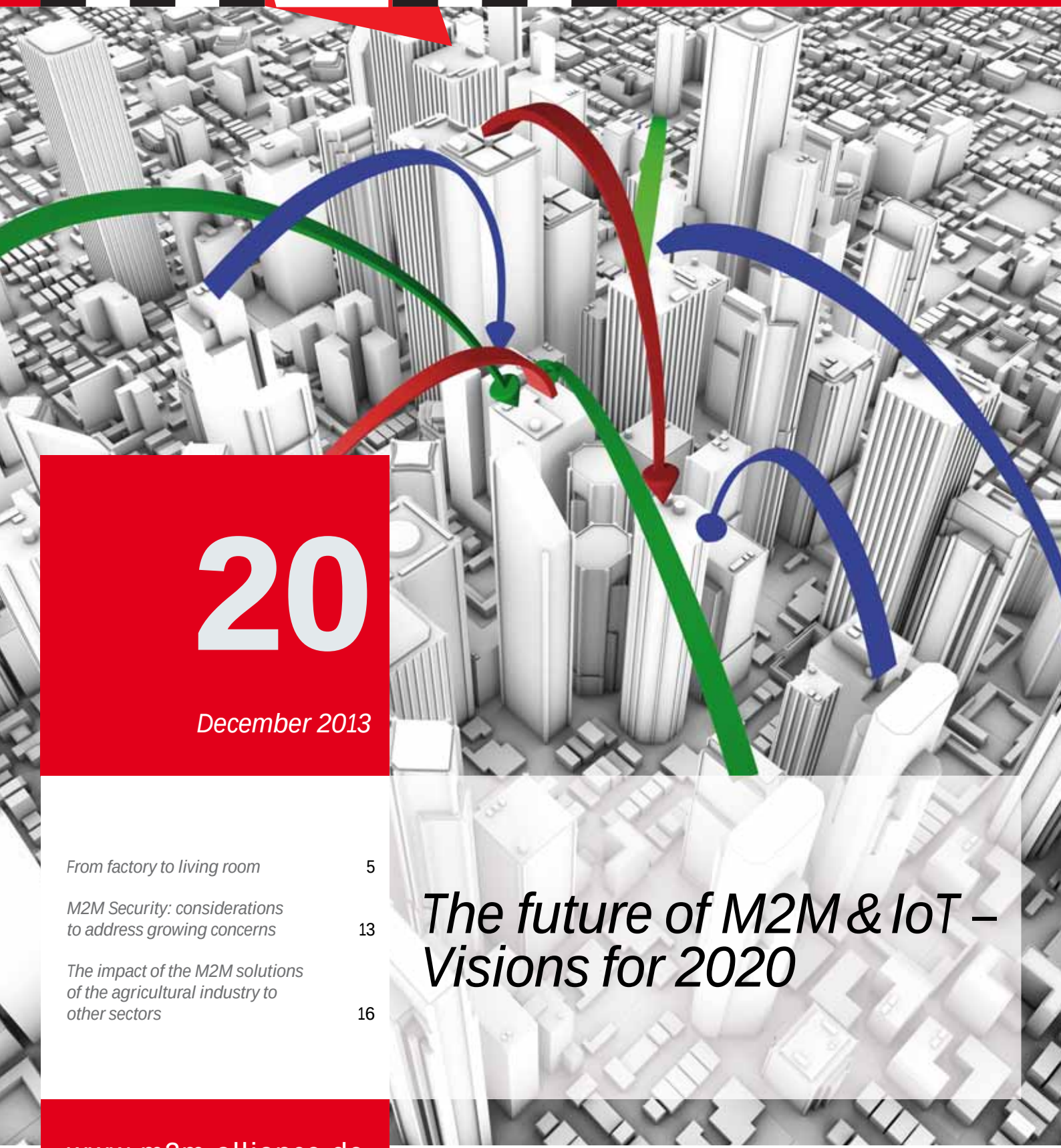

20

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The future of M2M & IoT – Visions for 2020

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Short-range low power wireless devices and M2M / Internet-of-things

Short range wireless technologies will play an important role in M2M solutions where small devices (such as various sensors) are connected to services on a wide-area Internet network.

Today, the devices used in the "last 100 meters" are typically not connected. The wide-area network is to a larger extent connected e.g. through smartphones, home routers (e.g. ADSL routers) and GSM/3G/4G Routers.

Requirements on "Last 100 Meters" technology

An architecture with a gateway that serves as an interface between the wide-area network (Internet) and the short-range network is required. For M2M, a required feature of the chosen short-range technology is support for mobile use cases where a smartphone or other mobile device can be used as a temporary gateway. Some of the important drivers when selecting the appropriate short-range wireless technology for M2M use cases are cost of the radio technology, Power consumption, Easy-of-use, Security (authentication and encryption), Available ecosystem (possibility to connect to smartphones, tablets, PCs, home gateways, etc.) and Range.

Which short range wireless technologies should one choose?

Different technologies like NFC, 82.15.4, IRDA, Classic Bluetooth, Bluetooth Low Energy, Wireless LAN etc. compete in this space including international standards, business verticals specific standards and many proprietary technologies. The preferable technologies are according to our view Bluetooth Low Energy, 802.15.4 and Wireless LAN. A short conclusion for these technologies is:

- *All three technologies have built-in link layer authentication and encryption.*
- *Bluetooth low energy has the potential for the lowest power consumption.*
- *The lack of native support for 802.15.4 in the for the ecosystem's important mobile devices (smartphones, tablets, laptops, etc.).*
- *802.15.4 has a main advantage in its range since many 802.15.4 based technologies (e.g. ZigBee) support mesh whereby coverage can be extended by using routers.*
- *Bluetooth low energy is very reliable with its support for Adaptive Frequency Hopping (AFH) and other features inherited from Classic Bluetooth.*
- *Wireless LAN, also commonly referred to as Wi-Fi, can be used in devices with less demands on low power consumption and as a wireless backbone in combination with other technologies.*

The connectBlue conclusion is that Bluetooth low energy has a high potential in becoming an important technology for the "last 100 meters" in low power, low cost, small devices. However, there will still be use cases where 802.15.4 based technologies are used especially in areas where it is already established. Wireless LAN will be used in devices where cost, low power is less important and as a wireless backbone combined with the other wireless technologies.

The "last 100 meters" represents >90 % of the potential number of connections.

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