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Towards a redundant, robust, secure and reliable IoT network

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The interest in the Internet of Things (IoT) is growing exponentially so multiple technologies and solutions have emerged to connect mostly everything. A 'thing'can be a car, a thermometer or a robot that, when equipped with a transceiver, will exchange information over the internet with a defined service. Therefore, IoT comprises a wide variety of user cases with very different requirements.

After having studied various Low-Power Wide Area Network (LPWAN) protocols CERN finally selected the Long Range Wide-Area (LoRa) network as base protocol which marked the start of the establishment of an IoT network at CERN. In order to build a functioning basic infrastructure LoRa gateways and a network server have been selected. With these basic components it was possible to build a simple IoT network. Unfortunately this configuration is not suited for a productive environment as it is not reliable enough.

To improve the reliability and security of the network it is necessary to identify the weaknesses of the technology used as well of those of the current infrastructure. Furthermore, it must be determined which of these vulnerabilities can be improved and which cannot.

CERN is currently running two projects that comprise several thousand end devices and thus put the IoT infrastructure to the test.

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