IoT now supports mission critical use cases that ensure user safety, minimised environmental impact and efficient, profitable operations. The following case studies illustrate how Thales is helping customers in multiple industries across the globe

Transportation - aircraft maintenance

Context

Safety of an aircraft is always the highest priority for an airline or operator. Monitoring of the aircraft safety data – including data for preventive maintenance – can be a tedious, costly and labour-intensive process, which needs constant monitoring, analysis and expertise.

A manual download option is available. To do this, dedicated personnel must regularly go to the aircraft to manually remove the recording media or access the data ports. If connecting to a port, a cable is attached to download the required data and then brought to a specific computer to transfer the data in the files for further data analysis.

As an alternative, a wireless option is very simple, secure and useful for transferring the data to the servers within minutes after landing the aircraft. Wireless delivery enables automated data transfer to and from the aircraft through existing cellular or Wi-Fi networks.

Tracking and tracing - containers

Context

To export goods, shipping containers travel extensively and pass through the responsibility of many different partners. Tracking them is therefore essential to ensure successful delivery to the required destination. At the same time, companies are often charged for demurrage and detention costs if their container stays too long in a port, or an empty container return has been unexpectedly delayed.

In addition to this, the condition of the container also requires monitoring. Typically, this includes whether it has been opened or not. In addition, refrigerated units with perishable content need close monitoring and a recorded audit trail to ensure temperatures have not exceeded required limits.

This tracking and tracing activity is needed however long a container remains in any particular country.

Utilities - smart water

Context

With the increasing need to conserve water and with the effects of climate change, there is an increasing need for smart water meter deployments for water utilities. These have a long life of more than 15 years in the field with no external power and, for a particular utility, may be deployed in multiple countries.

The cellular technology used for the connectivity is low data rate and low power NB-IoT. This must operate effectively for a minimum period of ten years on a single battery charge.

SPONSORED CASE STUDIES

Problem

As aircraft land in many different locations and countries, it is essential that the cellular solution can utilise the most appropriate local cellular network wherever it lands. A large amount of aircraft safety data is transferred at each landing, so it would not be cost effective for the data connection to be subject to a roaming tariff structure and being locked in to one particular network operator worldwide. Instead, when the aircraft lands, it should automatically connect to the most appropriate local cellular network so the safety data can be sent as soon as possible.

Solution with Thales Adaptive Connect (TAC)

The TAC smart agent running in the embedded SIM (eSIM) of the cellular device in the aircraft will detect if it needs a new network profile to connect to the local network. If so, it connects to a remote server to provision an activation code and relevant details of the MNO that will supply the profile required. It then pulls the required profile from the MNO's server and activates it without manual intervention. This establishes the correct cellular connection to the local network and onwards to the flight safety server to set up the data link for automatic transfer of the aircraft safety data.

This solution significantly reduces the time to connect to the flight safety server and ensures the fastest download of this important data.

Problem

On land, wireless coverage is required at all times. As containers move, this coverage varies and a solution is required to cater for that. In addition, permanent roaming is becoming an increasingly important issue. This refers to a device that stays out of its home network for a longer time, typically over 3-4 months. In some countries, permanent roaming is prohibited, while others effectively ban it by requiring the connectivity to be provided by a locally registered network operator. The rules about permanent roaming vary dramatically between countries and are continually evolving.

Solution with Thales Adaptive Connect (TAC)

The TAC smart agent running in the eSIM of the cellular device in the container will detect if it needs a new network profile to connect to the local network. If so, it connects to a remote server to provision an activation code and relevant details of the local MNO that will supply the profile required. It then pulls the required profile from the MNO's server and activates it without manual intervention.

TAC also provides for automatic fallback to a previous profile or to the bootstrap profile in case of coverage issues. The bootstrap profile can be used to initiate the download of a new network profile if that is needed. In this way, TAC works to ensure optimum coverage at all times.

Problem

There is a gap between the normal contract period for cellular connectivity and the field life of a smart meter. As a result, there may be a need to change network profiles in the field. On the other hand, downloading the first profile remotely uses battery power that many utilities would like to avoid.

Solution with Thales Adaptive Connect (TAC)

To avoid downloading the first profile remotely, TAC allows for provisioning it in the device at the factory – termed In Factory Profile Provisioning (IFPP). This enables the manufacture of a single SKU which can then be personalised at the very last stage with the initial network operator profile that is the right one for the site where the meter will be deployed. When installed, the smart meters are activated and use the network profile already installed. If a subsequent change of profile is required as a result of a new connectivity contract negotiation, this can be managed remotely through TAC.

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