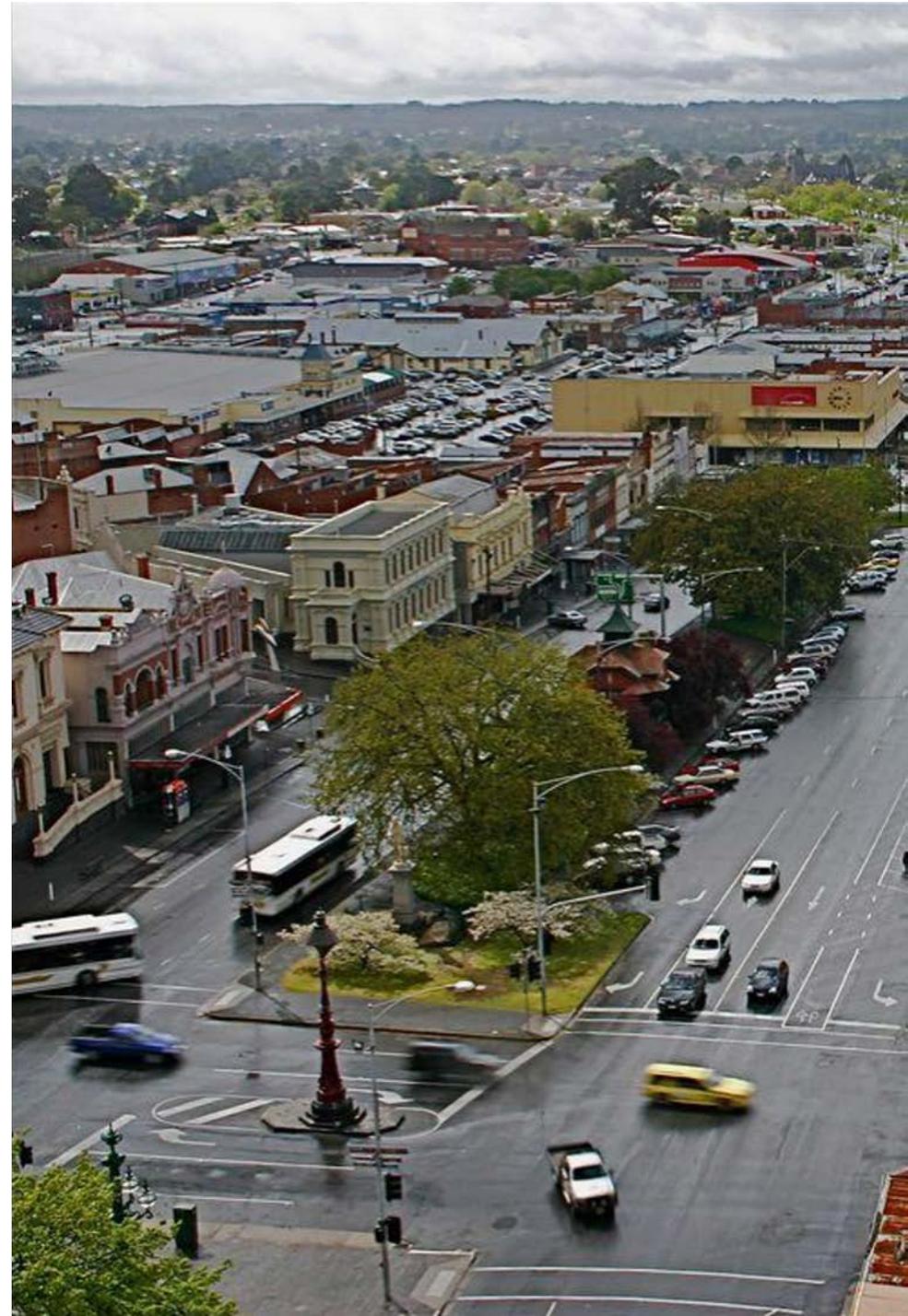




When it's time to scale: IoT Infrastructure for Cities & Communities

The shift from trial to scale

- > Infinite devices
- > Infinite data from many sources
- > Infinite applications
- > Multiple network technologies
- > Many end users - internal and external



Three Infrastructure Requirements

1. Scalable Network Infrastructure
2. Scalable Service Levels
3. Scalable Data Layer

LoRaWAN Carrier Network: Built for interoperability, affordability and scalability



Ultra Low Power

Long battery life with the lowest power of any LPWAN



Open standards

Globally interoperable technology supported by the largest global ecosystem



Carrier service

Guaranteed end-to-end service levels of data, from device to applications



Seamless Integration

Data platform for integration with any internal system or third party platform



Scalable

High capacity, scalable network with secure central control of multiple devices



Secure

End-to-end security at every level based on global standards

Understanding the differences



Carrier Network

- > Guaranteed end-to-end service levels
- > Network assets protected by the Telecommunications Act
- > Only Carriers are allowed to connect third party devices enabling shared infrastructure and services
- > Carriers design and operate in accordance with the highest possible standards
- > The Carrier is accountable for the security of the data and devices in accordance with the Australian Federal legislation

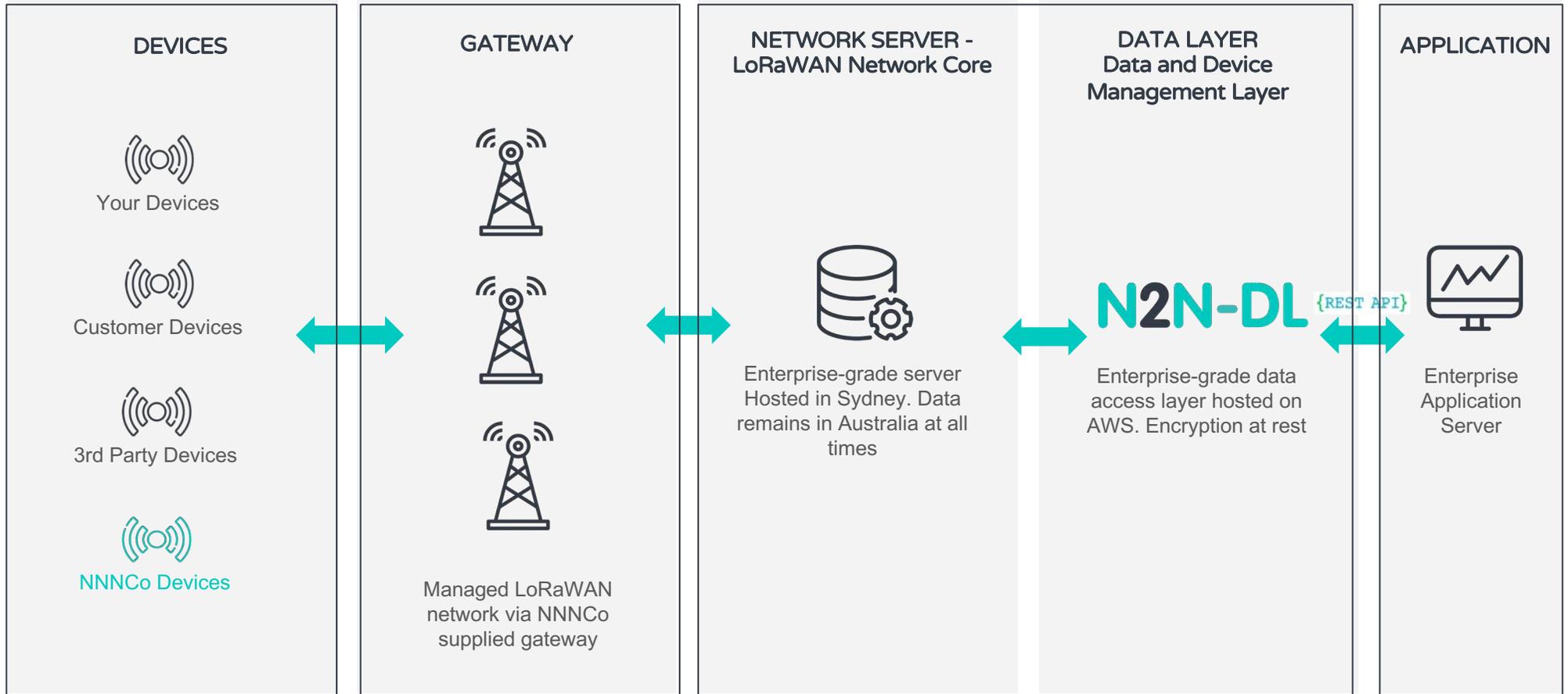


Community Network

- > Crowd-sourced network model
- > Network extended by anyone with a gateway eg: developers, enthusiasts and universities to test and build new products
- > Limited Service Level Agreements
- > No protection against gateways being turned off or taken out of service
- > Cities using community networks can't sell third party services over the network

Network Architecture

Sustainable and Scalable IoT Outcome



The Four Pillars Architecture

Flexible Network Models for Cities



NNN NaaS

Managed Network
as a Service

Carrier-grade managed network service and connectivity for your devices, without the CapEx



NNN Partner

Infrastructure
Partner Network

Partnering option for the deployment of LoRaWAN gateways on city-owned assets for carrier-grade connectivity and management



NNN In a Box

Self-installed Network
in a Box

Carrier-grade LoRaWAN Network-in-a-Box that can be self-installed when and where it's needed



NNN On Demand

Managed Network
built to specification

Custom-built carrier-grade LoRaWAN Network and management for Enterprise and Government customers

Achieving 100% coverage with guaranteed service levels of the data

We work with the city or community to mould the network to ensure 100% coverage and consistently provide guaranteed service levels as the network grows.



AVAILABILITY

Availability and up-time of the network



RELIABILITY

Ensuring your data gets to its destination



SECURITY

Preventing unauthorised access to your data and devices

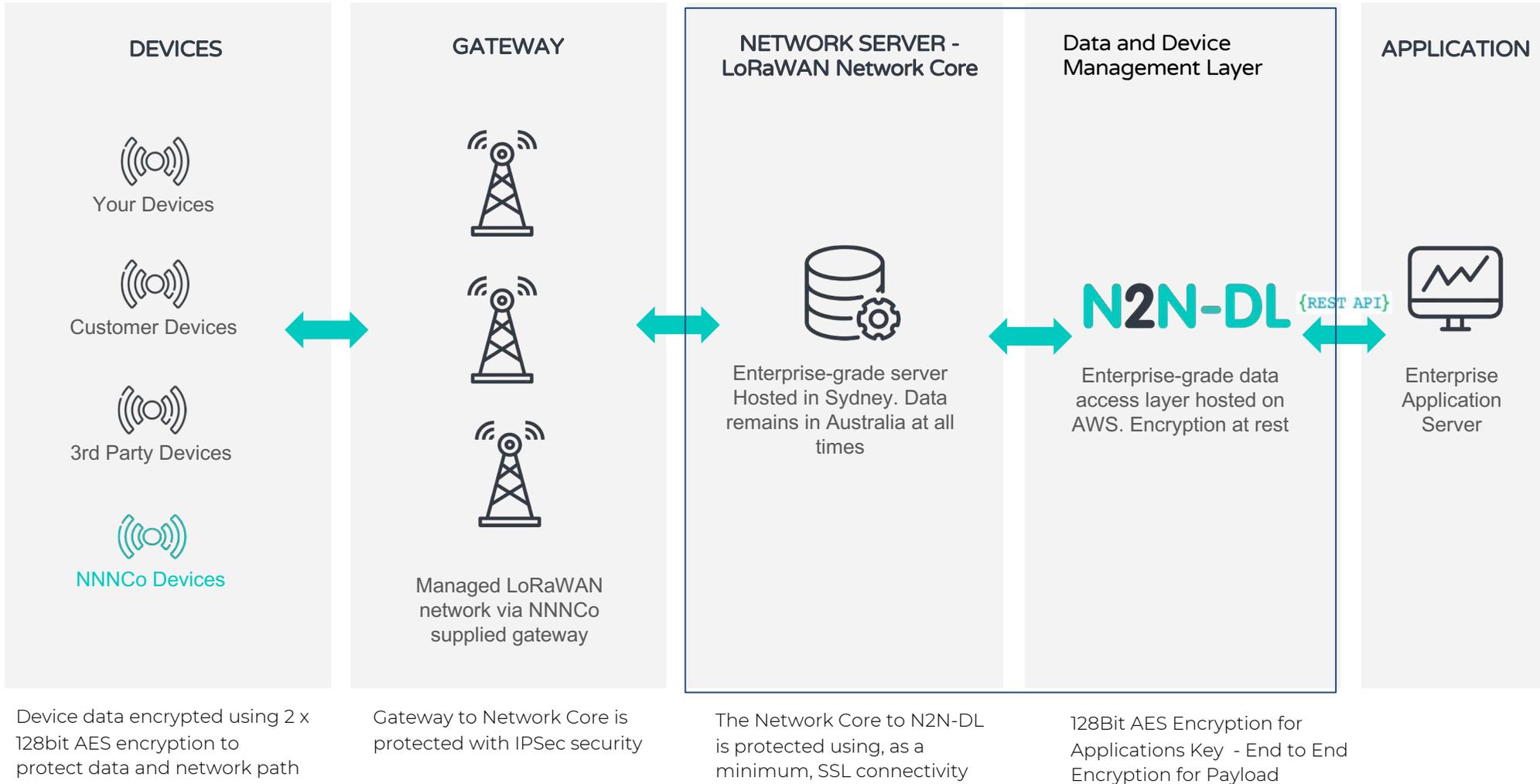
Importance of end-to-end security

Cities must prevent unauthorised access to device and customer data at every layer

- > Device
- > Gateway
- > Network Server
- > Data Platform
- > Application

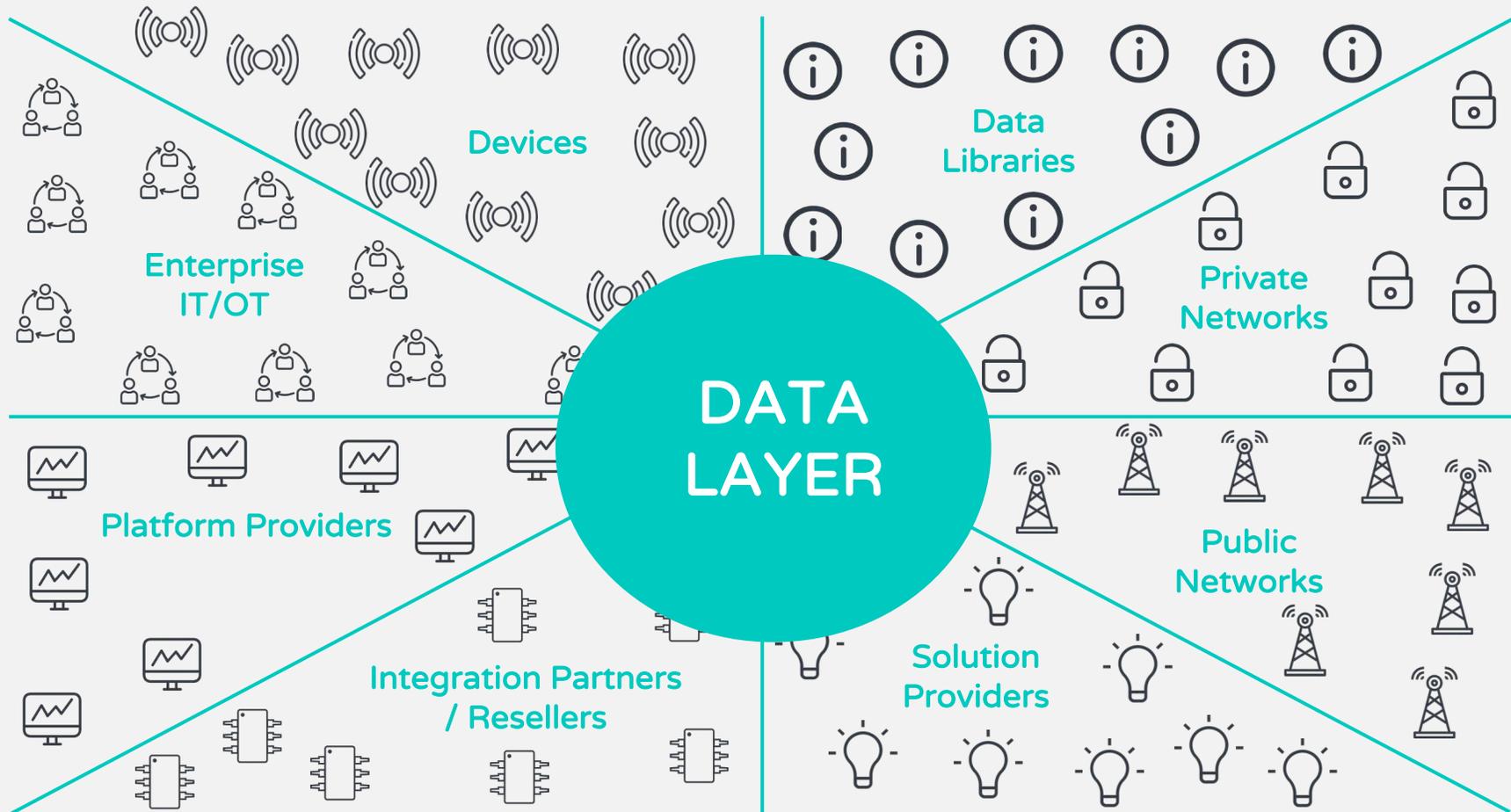


Network Security Architecture



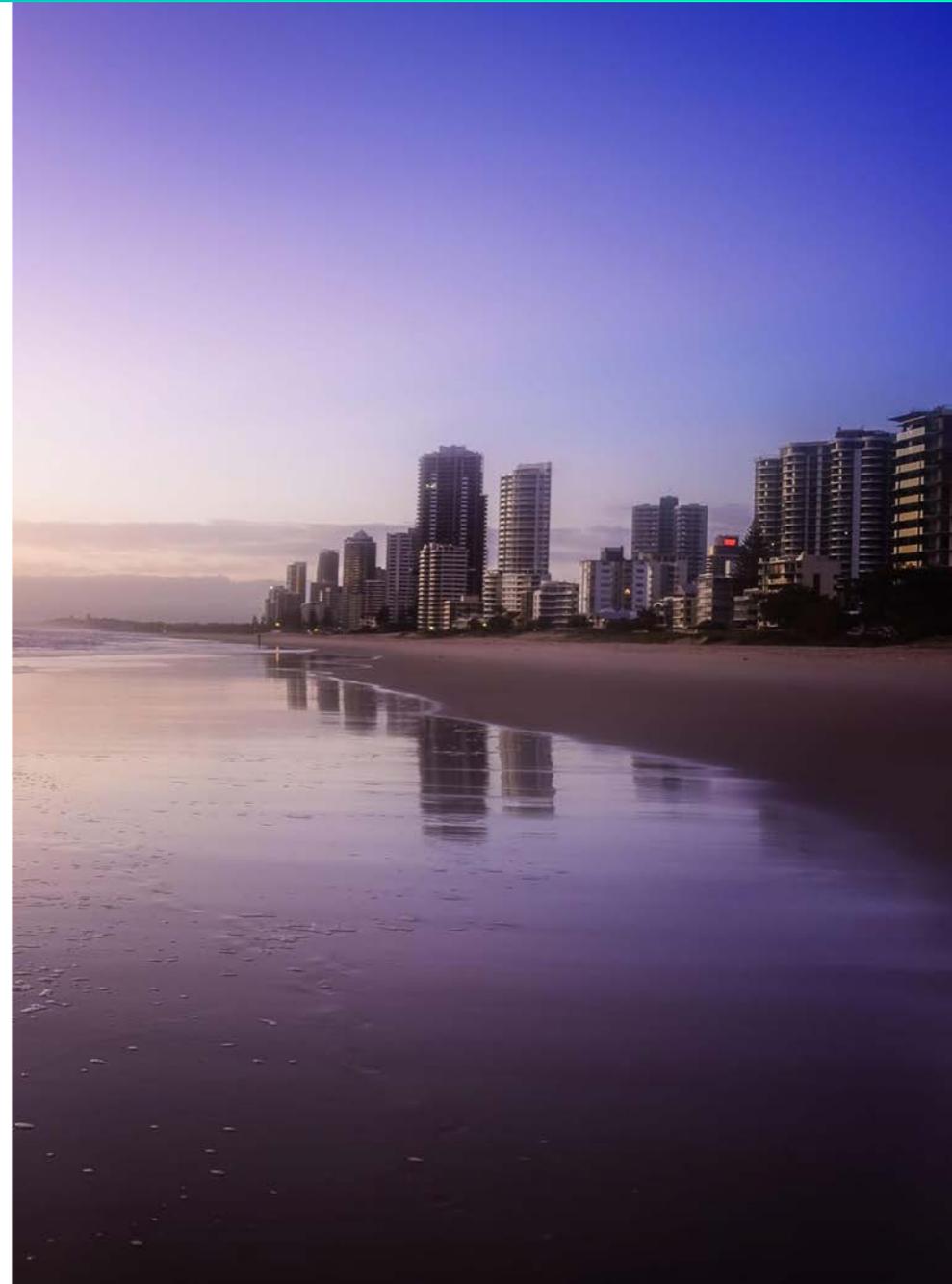
End-to-end security

To scale IoT, we need to create a relationship between all the ecosystem parts



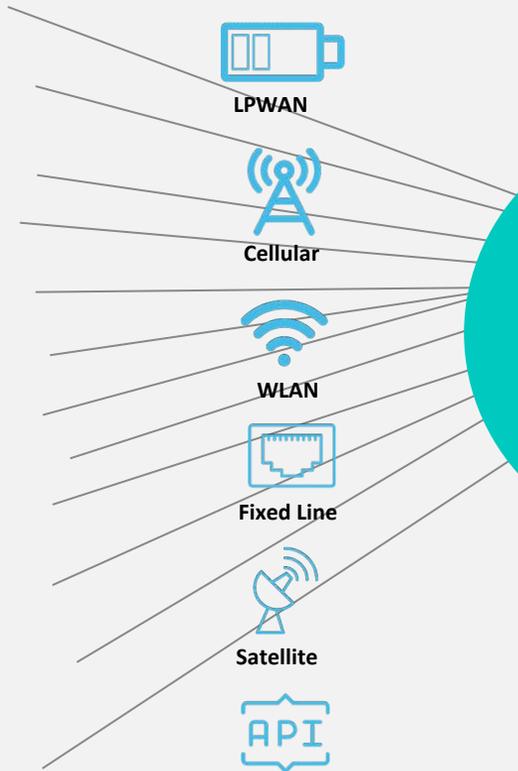
How?

- > An enterprise data platform like NNNCo's N2N-DL aggregation platform
- > Delivers data from any device, source or network to any system, platform or application (technology agnostic)
- > Takes a feed from any data or network source and converts it into a single rest API
- > Supports the rapid scalable deployment of infinite devices across infinite use cases and industries



Solves systems & device integration complexity

Infinite applications



- LPWAN
- Cellular
- WLAN
- Fixed Line
- Satellite
- API

Any platform

- AWS IoT
-
- Amaia
- CISCO
- Customer systems
- N2N-Vis
Visualisation Framework

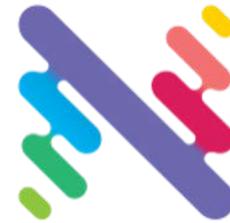
Combined with a carrier LoRaWAN network, the data layer enables the city or community's network to be 'turned on' as shared infrastructure

- > Ability to distribute third party services and enable infinite applications and device choice
- > Open up the infrastructure to business, enterprise, innovators and citizens
- > Revenue generation opportunities for the city as infrastructure owner
- > Without breaching any security protocols



Real World Models

CITY OF
GOLDCOAST.TM



City of
Newcastle



TasNetworks

AGRICULTURE VICTORIA



 SafetyCulture

The logo icon for SafetyCulture, featuring a stylized 'S' shape composed of several parallel, overlapping diagonal bars in shades of yellow, green, and blue.

Thank you

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