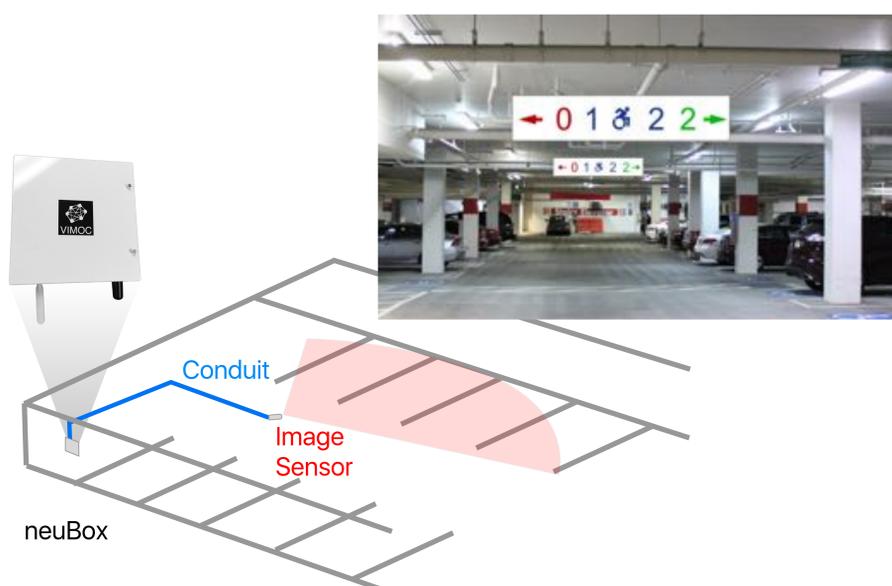


VIMOC Smart Parking Solutions

A truly smart parking environment should manage vehicle traffic such that congestion and delays are kept to a minimum. Drivers that are seeking parking spaces are one of the greatest contributors to congestion and delay in on-street and garage parking, regardless of the size of the city, university, hospital or corporate campus. Solutions that reduce congestion and travel delays lead to less carbon emissions, a cleaner environment, less stress for parking customers, more business and a more pleasant, liveable situation.

VIMOC enables the implementation of innovative parking occupancy systems by leveraging the end-to-end computing capability of its Landscape Computing technology. VIMOC's edge-to-cloud software stack collects and aggregates sensory data in a robust method, efficiently computing, storing and presenting the results through a standard Application Programming Interface (API). Landscape Computing allows for the combination or selection of Individual space detection as well as camera-based building occupancy management.



Individual Space Detection

Many applications require the management of individual parking spaces. The data detailing the use of individual spaces provides important information for smart parking systems in terms of statistics, planning, and management. In order to enable functionality such as payment and enforcement, as well as creating new services related to the user interface, easy accessibility of data is key. VIMOC's API makes this easy.

VIMOC has developed an individual parking-space management system using vision-based sensors. A camera is positioned to view several parking spaces, the live feed of which is fed directly to a neuBox that is embedded with VIMOC's Rosella software. Deep learning algorithms are employed to recognize changes in state for each parking space in view.

The neuBox collects and aggregates this data and outputs the intelligent results which are available through the API from VIMOC's Rosella cloud services. A dashboard shows information about hourly turnover, average duration and current occupancy information for each parking space. Owners of the website can also define zoomed-out zones for which they are interested, presenting collective parking zone information in real-time. The data is accessed through the same API that all VIMOC-connected sensory information is available. These sensors feed in to the Landscape Computing Platform. If a break in the LTE network or internet connection occurs due to congestion or outages, the Landscape Computing network retains its functionality, and when the connection to the cloud resumes all the data remains intact and uncompromized.



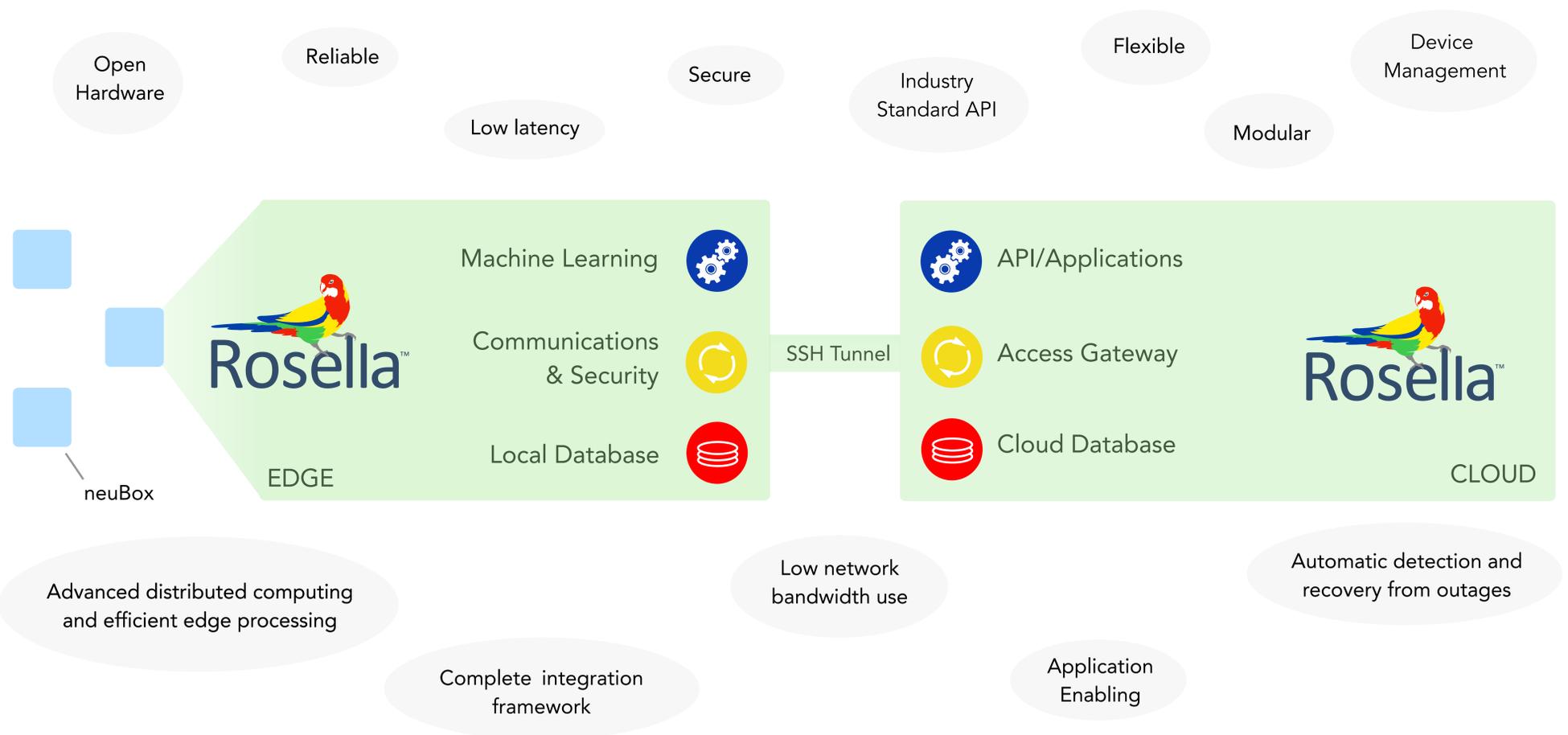
VIMOC has a developer API based on industry standard technologies, which allows third party vendors to integrate live information from VIMOC's Landscape Computing network in order to enrich and enable new applications such as enforcement, mobile parking availability and guidance apps.

Rosella™ Landscape Computing Software

VIMOC's Rosella™ IoT software stack is an end-to-end solution from the edge of the network to the cloud. This solution creates a seamless and robust link that allows intelligent infrastructure to drive intelligent applications.

Rosella Embedded is a distributed software solution performing sensory data capture and processing at the edge of the network, while efficiently cooperating with other Rosella Embedded computing nodes and the Rosella Cloud. Each embedded software node performs data normalization, message parsing, edge processing pipeline and storage, with an extended framework for machine learning, vision processing etc.

Rosella Cloud is the software component which communicates with the Rosella Embedded computing nodes to authenticate and collect the intelligence produced by this network. This intelligence is presented via the Rosella API to enable advanced applications and services, including visualization, data mining/ analytics etc.



Enabling a new generation of services & applications

The Rosella platform will enable a new generation of applications to enhance customer convenience, lower labor costs, improve cash management and increase overall productivity. This is thanks to the Rosella Embedded machine learning framework, consisting of a library of deep learning machine vision algorithms for detection and classification tasks. The Rosella Embedded software can also connect to a variety of sensors that are commonly used in parking infrastructure. This feature enriches the data available to Rosella API developers to design new applications and enhance existing services such as valet parking and wayfinding.