Lifting the Barrier to Airport eGate Deployment

Introduction

When it comes to adopting new technology, the aviation industry has always been at the forefront. From crucial security measures such as luggage scanning to enhancing passenger experience with onboard Wi-Fi, the aviation industry has consistently leveraged technology to improve security and efficiency.

One area of focus has been the introduction of automated entry gates for arrivals, commonly referred to as e-Gates, to reduce the manpower needed to perform the necessary immigration checks for arriving passengers.

By automating the passport control process through the use of advanced technologies such as facial recognition, e-Gate systems enhance border security while streamlining passenger flow to prevent crowding, long waits, and reduce reliance on human resources.

A systems integrator specializing in the development of e-Gates chose AAEON's BOXER-6646-ADP as the embedded computer for a new project. This study highlights how AAEON's BOXER-6646-ADP provided targeted solutions to the customer's pain points and helped them bring their eGate solution to market.

Identifying Barriers to Deployment

The complexity of the customer's proposed eGate architecture presented a number of challenges when it came procuring its key components. This was particularly true for the embedded hardware needed, considering the small dimensions of the application's housing. Therefore, their first priority was to identify an embedded system compact enough to fit into the limited space of an electrical cabinet.

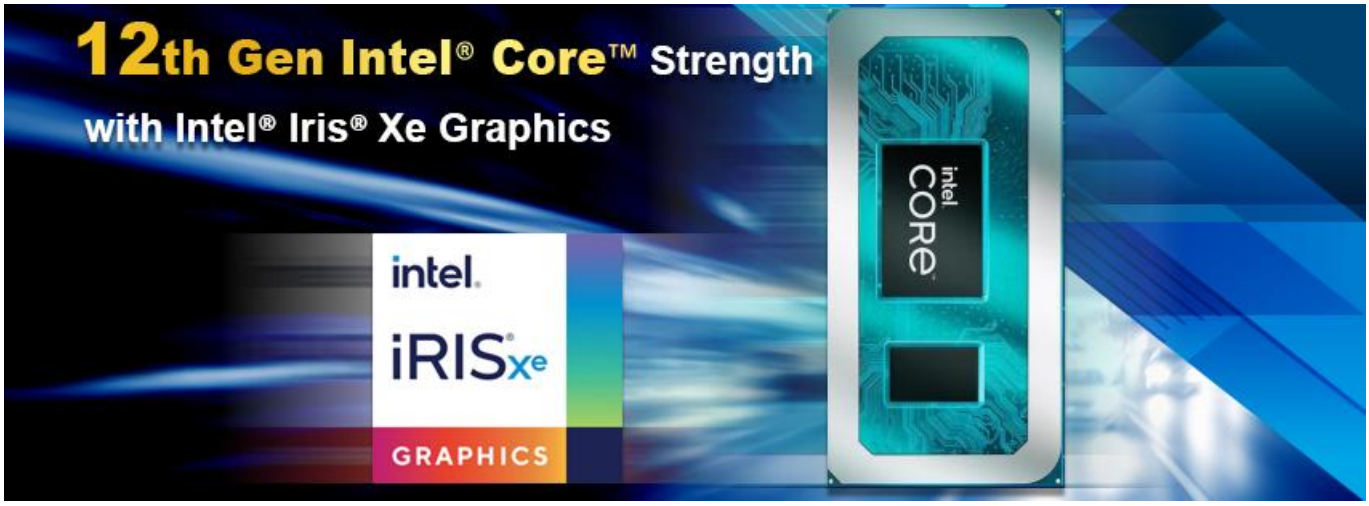
Designs for the eGate application called for two screens per unit, while also allowing for the installation of multiple cameras and an RFID reader to scan and verify passenger passports. An overlooked factor was that the system used would also need adequate processing capability to manage the data from these peripheral sources and provide a platform for the customer's AI inferencing software to run.

Getting the Application Off the Ground

The customer chose the BOXER-6646-ADP from AAEON's Box PC range as the system responsible for powering their eGate application. With dimensions of just 220mm x 154mm x 61.6mm and a fanless design, the customer was able to integrate the BOXER-6646-ADP into the limited deployment space without any issues. Despite this, the system's support for both 12th and 13th Generation Intel® Core™ Processors meant that it had more than enough computing capacity to handle high-intensity workloads while maintaining power-efficiency.

When it came to peripheral device support, the BOXER-6646-ADP also delivered. The system was able to accommodate both the primary and secondary display screen requirements of the application through its two HDMI ports. Additionally, two of the system's three USB 3.2 Gen 2 ports were utilized to install the cameras necessary for capturing passenger data. The BOXER-6646-ADP's third USB 3.2 Gen 2 port was occupied by an RFID reader. The RFID reader's purpose was to scan passenger passports to acquire the corresponding information for the customer's software to compare with the data obtained by the system's USB cameras.

While the majority of the computing tasks for the application were made possible by the BOXER-6646-ADP's strong CPU and supported by its DDR5 system memory, it was not the responsibility of the BOXER-6646-ADP to determine the validity of the data acquired from its peripheral devices. Instead, this was the customer's proprietary software models, which leveraged AI inferencing technology.



This is where the BOXER-6646-ADP's Intel® Iris® Xe Graphics came into play. Leveraging the graphics package's high render clock frequency, capacity for up to 96 execution units, and Intel® Deep Learning Boost, the customer's software could execute biometrics tasks with speed and accuracy.

Additional support for the customer's inferencing model came via the BOXER-6646-ADP's M.2 M-Key slot, in which the customer opted to install a Hailo-8™ M.2 2280 AI Accelerator Module. By doing so, they were able to take advantage of a second AI acceleration platform through which to run their software.

Sky High Added Value

Beyond addressing immediate requirements, the BOXER-6646-ADP provided added value to the customer. Powered by 12th/13th Generation Intel® Core™ Processors and DDR5 memory, the system offers fast processing and data transmission capabilities essential for real-time facial recognition and data analysis.

Multiple LAN ports enabled could be used to secure wired connections to the airport's intranet system, with additional data security bolstered by the system's onboard TPM 2.0. Moreover, with support for Wi-Fi and 4G/5G connectivity, the BOXER-6646-ADP could facilitate seamless communication with the airport's data center, ensuring uninterrupted operation and data exchange.

The BOXER-6646-ADP not only solved the challenges faced by the customer in developing their eGate application, but also provided additional functions to maximize its operation.

By helping the customer overcome the challenges they faced in finding the right solution, AAEON demonstrated once again that embedded solutions can produce fulfilling outcomes for its customers and also contribute to the adoption of technology that helps make day-to-day tasks more streamlined.

About AAEON

Established in 1992, AAEON is one of the leading designers and manufacturers of industrial IoT and AI Edge solutions. With continual innovation as a core value, AAEON provides reliable, high-quality computing platforms including industrial motherboards and systems, rugged tablets, embedded AI Edge systems, uCPE network appliances, and LoRaWAN/WWAN solutions. AAEON also provides industry-leading experience and knowledge to provide OEM/ODM services worldwide. AAEON works closely with premier chip designers to deliver stable, reliable platforms. For an introduction to AAEON's expansive line of products and services, visit www.aaeon.com.