MSI PLUS – Hyper (ETC system)

ETC system and challenges

Electronic toll collection (ETC) is to eliminate the delay on toll roads by collecting tolls electronically. ETC determines whether the cars passing are enrolled in the program, alerts enforcers for those that are not, and electronically debits the accounts of registered car owners without stopping at toll booths.

ETC system requires car to has a Etag (UHF RFID) to response ETC sensors. Thus, there's a UHF RFID reader with antennae to sensor every car on the barrier stop. Nowadays, even the Etag solution is mature and highly supported on toll road application, but the outdoor networking gateway is still to be a key challenge for fitting in the harsh environment. As we can see below harsh conditions of toll road environment.

1. Dramatic temperature (Devices will be exposed to be extremely freezing winter and torrid summer)
2. Facing hard raining or hurricane (Few devices can overcome the heavy raining directly)
3. Video/data transmission and controlling actively (bottleneck of bandwidth and computing requirements)

MSI provides ETC system solutions - X1000 series

MSI X1000 series is designed to be an IoT gateway for fitting in harsh environment which has high computing ability by Intel Apollo Lake-I platform. X1000 series also could be a smart solution in ETC system for solving the critical issues as descripted. Let's see the specialties of X1000 in ETC system.

- **High computing Fan less system**

MSI X1000 series was built in Intel Apollo Lake platform so it is very competitive to deal with computing loads as a controller, not just to be a switch. The processor of Intel Apollo Lake could up to 4 cores, 2.00 GHz high.

- **Wide-temperature endurance -40° to 70° and IP67 water-proof**

In terms of special components and thermal aluminum alloy, X1000 overcomes the dramatic temperature and hard raining conditions so that X1000 can be set upon to toll road barrier without a customized box for sheltering.

- **Comprehensive and high mobility network performance**

MSI X1000 series support 4 x GbE RJ45 ports for cable connecting and Wi-Fi/3G/4G for wireless network. Such comprehensive high bandwidth and mobility of networking surely reduced network devices of data transmission. Therefore, X1000 series can be a switch/router/controller to manage sensors and transmit video/data to control center directly.

Figure 1. MSI X1000 series in ECT system
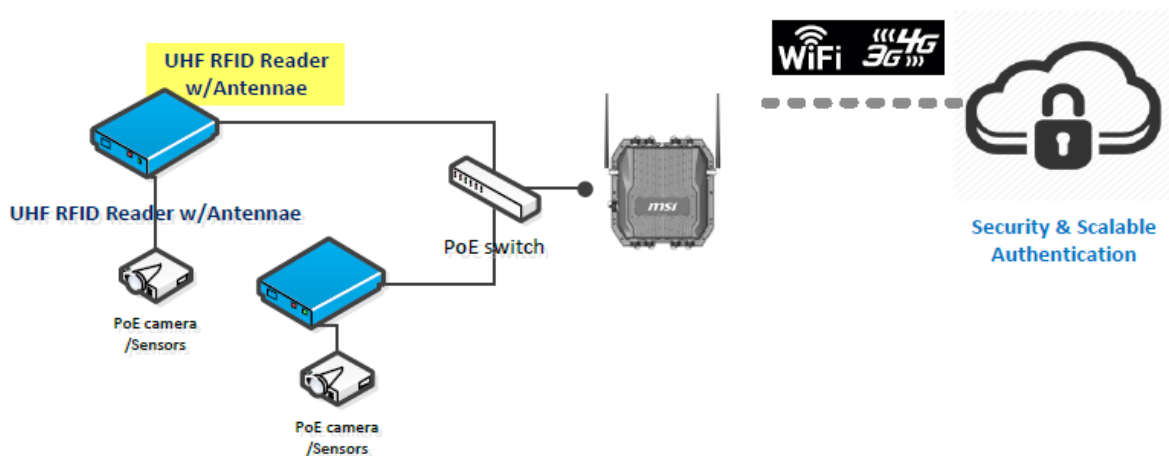
- **Compact size and antennae application**

Compact size is important factor to fit in diversity places and reduce space for wall mount installation. MSI X1000 only has 10.83" x 11.26" x 2.74" dimension with powerful Apollo Lake-I computing platform. Furthermore, there are two antennae options for extend functionality.

Above these MSI solutions for ETC system, we can greatly reduce the CAPEX and simplified whole system as figure 2 for reference.

Figure 2. MSI ECT system solution
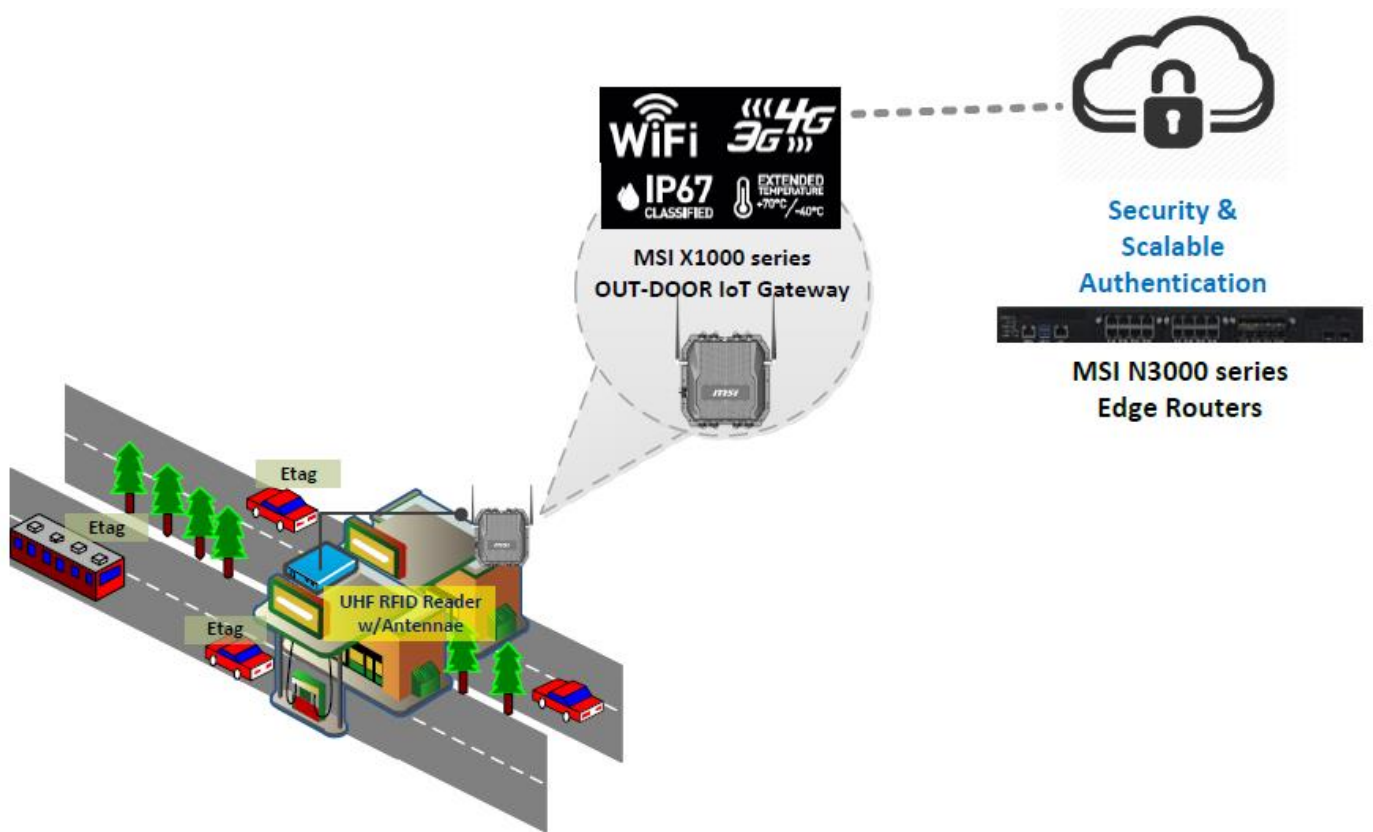
MSI solutions for ETC system

Environment-Pro
IoT gateway solution in harsh environment
o_o : Discover

Mainstream
Enterprise and campus security solution
o_o : Discover