

# Abstract

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## **New Wireless Architecture for In-Flight Entertainment Systems Inside Aircraft Cabin**

A primary difficulty when investigating communication requirements rises when a very specific field as an aircraft cabin is considered. The diverse needs of passengers are often incompatible to the strict constraints inside the cabin. Nowadays, In-Flight Entertainment (IFE) systems, for instance, are widely spread in modern flights. An IFE system usually consists of a Seat Electronic Box, the passengers terminal hardware, plus a Passengers Control Unit, the remote control to the service, a Visual Display Unit, the screen. Using the wireless technology in these systems can increase the satisfaction level of both the passengers and the avionics companies. However, the inside of the cabin is not a flexible environment reliability and safety are two mandatory requirements, so different constraints are imposed. This means that off-shelf technologies (hardware including antennas, network topology, network protocols and services) are usually not suitable for such environment. Consequently, a new architecture has to be designed and implemented. This paper aims at integrating heterogeneous available communication technologies, showing their pros and cons, within this context, while considering the imposed communication restrictions inside the aircrafts cabin. From that, a new wireless heterogeneous architecture is proposed. In addition, to be able to use such architecture, we propose a new protocol, which utilizes the smart antennas technology to allow Passenger Control Units to be recognized and configured autonomously without any external intervention. K