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Fixing In-Flight Wi-Fi

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Think about the last time your Internet connection went out at home or at work. It probably didn't take more than a few panicky minutes before you started to feel less productive and cut off from the rest of the world. And when your connection was restored, it gave you a newfound appreciation of just how much you rely on the Internet.

So, it's surprising how every day, millions of people give up connectivity for hours on end simply because they've boarded a plane. That's a problem for some passengers and airlines alike, but the good news is that Wi-Fi can be as available in the air as it is on the ground.

One reason is that the business foundation is already there. For over a decade, airlines around the world have offered in-flight Internet connectivity to passengers as a premium service. In recent years, faster, higher bandwidth satellite connections and cellular-based air-to-ground networks have steadily lowered the cost of providing in-flight service. This trend should help make in-flight Wi-Fi a mass-market service, something that most travelers use rather than just businesspeople who can expense it.

Even so, many passengers still don't use it. Why?

Why it's so hard to get and stay connected

One major hurdle is difficulty connecting due to the traditional captive portal method. Passengers must connect to the service set identifier (SSID), then navigate to the landing page, and finally register and pay. It's as tedious as the airport security screening gauntlet. But unlike security, frustrated passengers can opt out of using in-flight Wi-Fi—and often do.

In an online journey, each incremental step usually leads to a 50 percent dropout. Most dropouts due to this unnecessarily complex connection process are lost revenue, direct or indirect, for ecosystem members: airlines, mobile operators, satellite, air-to-ground backhaul services, avionics vendors, and hub services that facilitate roaming.

For business travelers, another common barrier is their employer's virtual private network (VPN). Once they're connected to the aircraft's Wi-Fi network, connecting to their VPN subsequently blocks access to onboard services such as in-flight entertainment (IFE). To regain access, they must disconnect their VPN. This back-and-forth makes them less likely to purchase premium in-flight services—another revenue loss for airlines and their business partners.

To understand how these barriers can be overcome, it helps first to understand the nuts and bolts of how smartphones, tablets, and other devices get connected. The onboard Wi-Fi service facilitates the device's connection to the aircraft wireless local area network (WLAN), which then provides access to onboard services such as in-flight entertainment and internet access. This sounds straightforward, but it isn't. That's because currently there is no consistent, industry-standard method for devices to get associated with the in-flight system. In fact, the association process differs not only by airline, but also for each flight segment *within the same airline*.

What leisure and business travelers want—and deserve—is seamless, effortless, gate-to-gate connectivity. As soon as they board the aircraft, their device should automatically gain access to the airline's Wi-Fi network and services such as IFE and Internet connectivity, and then maintain all that until they disembark at their destination.

How to clear in-flight Wi-Fi for takeoff

Fortunately, there is an industry-standard framework that the airline ecosystem can use to facilitate this vision. It's called OpenRoaming, and it's in wide use worldwide. That means the airline ecosystem can assess its business value right now and implement it immediately instead of reinventing the wheel.

OpenRoaming was developed by dozens of equipment manufacturers, service providers, and other Wi-Fi ecosystem members under the auspices of the Wireless Broadband Alliance. WBA is an international organization focused on business andtechnical issues relating to Wi-Fi such as standards development, industry guidelines, trials, certification, and advocacy. WBA works closely with other industry organizations such as GSMA and the Wi-Fi Alliance, as well as regulators. One example is Passpoint, a protocol developed by Wi-Fi Alliance that is a foundational element of OpenRoaming. Dublin, Ireland is an example of how cities are increasingly using OpenRoaming to make it quick and easy for tourists and other visitors to get and stay connected to public Wi-Fi. Visitors to Dublin log in only once upon arrival and then maintain seamless connectivity as their smartphones, tablets, and other Wi-Fi devices automatically switch between different public Wi-Fi hotspots. After their initial log-in to an OpenRoaming-enabled hotspot, Dublin visitors' devices are automatically authenticated for use every time they switch to another OpenRoaming-enabled hotspot as they travel around the city.

This technology and operational model can be ported to the in-flight market. Implementing OpenRoaming would free passengers from the hassle of manually entering log-in credentials every time they fly. Instead, the aircraft's network would automatically authenticate and connect them on every flight after their initial log-in at one of that airline's plane.

Airlines also could provide Passpoint subscriptions to members of their frequent flyer programs. As Figure 1 illustrates, the aircraft's network then can use that Passpoint subscription profile to enable automatic association, thus providing frequent flyer members with a cellular-like experience in terms of a transparent connection to the network. The authentication for this subscription could be processed locally on the aircraft, thus enabling association below 10,000 feet, where no Internet connection is available.

Figure 1: Passpoint enables automatic association of passenger devices
click to enlarge

Airlines also can add Roaming Consortium Organization Identifiers (RCOIs) to their subscriptions. By broadcasting OpenRoaming RCOIs aboard the aircraft, the network now can be configured once to support many users, eliminating the need to configure each network for multiple cellular providers. Another key benefit is that RCOIs enable auto-connection to other networks in airports, hotels, and additional locations along thepassenger journey. That can be particularly attractive to business travelers who need to stay connected when they're off the plane, too.

Mobile operators can use the OpenRoaming federation to offer in-flight roaming services, so their customers have a frictionless, cellular-like connection experience via the in-flight Wi-Fi service. Those operators then can market on-board Wi-Fi as a perk to encourage consumers to upgrade to higher-tier plans or to sign up business travelers who need seamless, ubiquitous Internet connectivity as a must-have.

To summarize, OpenRoaming provides a variety of business benefits for airlines and other ecosystem members:

- A friction-free connection experience eliminates the main barrier to purchasing premium services such as IFE, meaning more revenue for airlines and their business partners.
- By simply adding the appropriate RCOIs to their network, airlines and other ecosystem members can leverage OpenRoaming to enhance security and privacy, which are key concerns for business travelers.

- As a federated service, OpenRoaming ensures that travelers get and stay connected at additional locations throughout their journey to and in the airport, and finally on board the aircraft. Airlines can use this gate-to-gate experience to foster new loyalty opportunities.

- OpenRoaming works alongside Wireless Roaming Intermediary eXchange (WRIX), the WBA industry standard to harmonize the Wi-Fi Roaming business between operators and network providers.

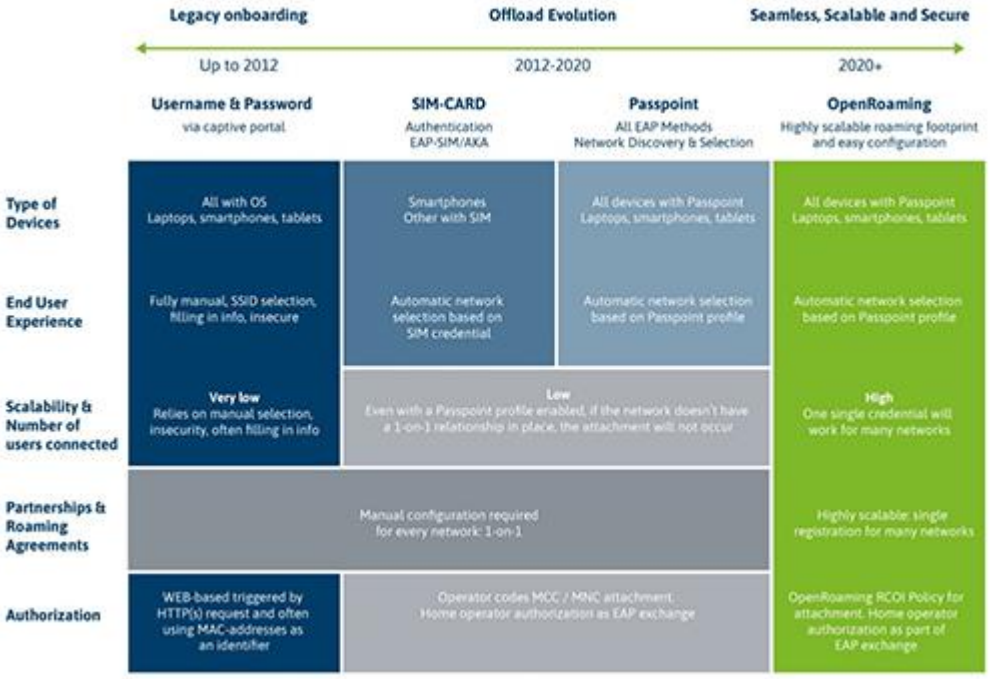

Figure 2: The evolution of in-flight Wi-Fi
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The bottom line is that OpenRoaming is a proven way to enable simple, seamless, and secure Wi-Fi access around cities, college campuses, and other public spaces (see Figure 2, above). The airline ecosystem can leverage OpenRoaming to provide travelers with the convenient, ubiquitous connectivity that benefits everyone.