Hospitality: Frictionless Guest Connectivity

Eliminating Roaming Charges and Replacing Unreliable Wi-Fi with Private 5G Networks.

Introduction

The hospitality industry is undergoing a digital transformation, driven by the increasing demands of international travelers who expect seamless, secure, and high-speed mobile connectivity wherever they go. Historically, hotels have relied on shared Wi-Fi networks to meet this demand, but these networks often fall short in performance, security, and user experience. Meanwhile, high international roaming charges discourage guests from using mobile data networks, creating a frustrating gap between expectations and reality.

A new opportunity is emerging to close that gap: **the rise of private 5G networks**. As more countries begin to allocate licensed or lightly licensed mid-band spectrum—especially in the **n77 and n78 5G NR bands**—for **private 5G deployments**, enterprises like hotels can now deploy their own localized, high-performance mobile infrastructure independent of traditional carriers. This regulatory shift enables hotels to create dedicated 5G networks on their premises, offering guests a better alternative to roaming or public Wi-Fi.

With this capability, hotels can deliver a dramatically improved guest experience, gain full control over connectivity and data, and create new revenue streams—all while positioning themselves as leaders in next-generation hospitality.

The Problem: Connectivity Isn't Meeting Traveler Expectations

Today's guests rely heavily on mobile connectivity, not just for communication, but for streaming, navigation, work, and digital services. Yet when they check into hotels abroad, they are faced with two poor options: pay steep roaming fees or attempt to connect to a hotel Wi-Fi network that is often congested, unsecured, or simply slow.

The situation is especially frustrating for international guests outside Europe, where data roaming costs can be prohibitively expensive. As a result, travelers limit their device usage and rely more heavily on public or semi-public hotel Wi-Fi networks, which often lack proper security protocols and perform poorly under demand.

This creates a gap between what guests expect and what hotels can currently offer. And in a competitive market, that gap represents lost opportunity, declining satisfaction, and missed upsell potential.

A New Alternative: Private 5G for Hotels

Our solution introduces a private 5G network designed specifically for hospitality environments. This system consists of compact 5G small cells (iCell TRINITY) deployed throughout hotel premises, connected to an on-site edge server running 5G core software. Guests gain access via a digital eSIM, provisioned instantly upon check-in by scanning a QR code. Within seconds, their smartphone connects to a fast, secure, hotel-owned 5G network, bypassing roaming entirely.

Because the data is routed through the hotel's existing broadband infrastructure, guests avoid roaming charges altogether. More importantly, they enjoy carrier-grade service that is faster and more secure than traditional Wi-Fi.

This system requires no physical SIM cards, no contracts, and no reliance on external mobile carriers. It offers a seamless and frictionless connectivity experience that is fully under hotel control.

How It Works

When a guest checks in, they are prompted to scan a QR code displayed at reception or in the hotel app. This triggers an over-the-air installation of an eSIM profile on their device—compatible with most modern smartphones. The device then automatically connects to the hotel's private 5G network. From that point on, all mobile data traffic is handled via the hotel's own network infrastructure and broadband backhaul.

The deployment is powered by a software-defined radio (SDR) base station and an edge server running 5G core functions. An integrated eSIM provisioning server enables secure and rapid profile assignment to guest devices. All traffic stays local to the hotel, allowing for full control, monitoring, and optimization by hotel IT or service providers.

Benefits for Hotels

For hotel operators, this model represents a shift from cost center to revenue generator. By offering tiered 5G access or bundling connectivity with premium rooms, hotels can monetize a service that guests already value. In doing so, they also reduce the operational and support burden associated with unreliable Wi-Fi networks.

Control over the network brings another advantage: data ownership. With a private 5G network, hotels can access real-time usage analytics, manage bandwidth allocation, and maintain a consistent quality of service.

Perhaps most importantly, offering cutting-edge connectivity enhances the hotel's brand image. It signals innovation and responsiveness to guest expectations—qualities that resonate with business travelers, digital nomads, and high-value clientele.

Benefits for Guests

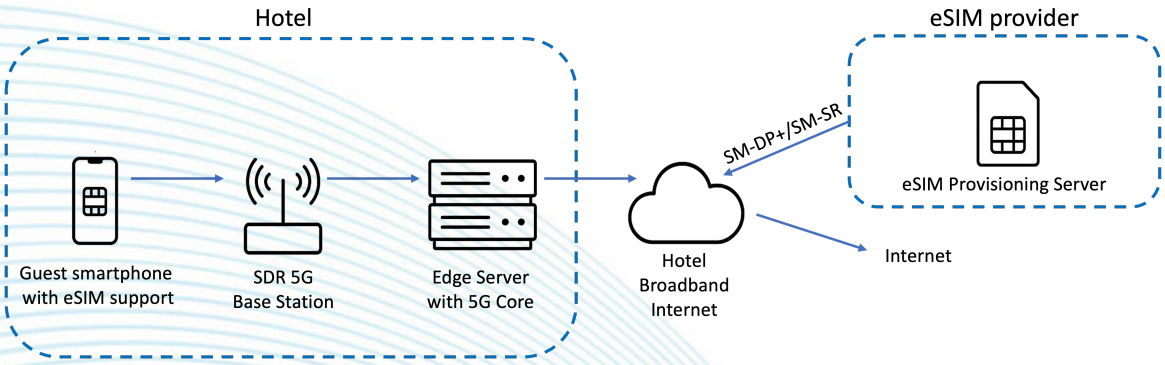
Guests enjoy full-speed mobile internet access without the stress of roaming charges or sketchy public Wi-Fi. The eSIM process is simple and fast—just a QR code scan—and the experience is indistinguishable from their usual mobile network, but often faster and more secure.

With the hotel's private network handling all data traffic, guests benefit from encrypted transmission, low-latency connections, and the assurance that their data is not traversing shared or insecure public infrastructure.

System Architecture

The proposed 5G hospitality solution is built around a **localized, private 5G network**, seamlessly integrated with **external eSIM provisioning infrastructure** operated by licensed carriers or MVNOs. This hybrid model allows hotels to maintain **local control over connectivity** while leveraging the **regulated infrastructure** needed for lawful and scalable eSIM activation.

Core Components



iCell TRINITY SDR 5G Base Station

A software-defined radio (SDR) small cell operates as the 5G gNodeB (gNB), providing localized coverage throughout the hotel. These indoor or rooftop units use low-power frequencies (e.g., n77/n78) and are plug-and-play with edge components.

Edge Server with 5G Core Functions

Hosted locally on-premises or in a nearby edge data center, the edge server runs a lightweight 5G core stack, typically based on open-source or commercial software (e.g., Open5GS, Free5GC, Amarisoft, or commercial core solutions).

Key network functions (NFs) include:

- **AMF** (Access & Mobility Management Function)
- **SMF** (Session Management Function)
- **UPF** (User Plane Function)
- **NRF**, **PCF**, etc., as needed based on the chosen architecture (SA or NSA)

eSIM Provisioning Workflow

Because eSIM provisioning is regulated and requires certified infrastructure, the system integrates with **external SM-DP+ (Subscription Manager Data Preparation) and SM-SR (Subscription Manager Secure Routing)** platforms.

These are typically hosted by:

- Licensed **Mobile Network Operators (MNOs)**
- Flexible **Mobile Virtual Network Operators (MVNOs)**
- Global eSIM platforms (e.g., **1oT, BICS, Truphone, iBASIS, Thales**)

The hotel system acts as a front-end provisioning initiator, triggering the process via API integration with the eSIM partner. The guest device communicates over HTTPS with the SM-DP+ server, and the profile is installed directly on the device using GSMA standard interfaces (notably **ES2+, ES8+, ES9+**).

Guest smartphone with eSIM

The guest smartphone (Android/iOS) must support eSIM. Upon scanning the QR code, it initiates a profile download through HTTPS and connects to the hotel 5G network. The network is configured to accept and authenticate devices with those eSIM profiles.

Hotel Broadband & Backhaul

The UPF routes guest traffic through the hotel's fixed internet connection (e.g., fiber or business-grade cable). Optionally, split tunneling or VPNs can route some traffic via the MVNO's cloud to meet regulatory or billing requirements.

Conclusion

Private 5G is emerging as a transformative opportunity for the hospitality sector—enabling hotels to deliver fast, secure, and seamless connectivity that meets the expectations of modern, mobile-first travelers. The technology is here, and the regulatory environment is increasingly supportive. At the core of this evolution is the iCell TRINITY 5G SDR base station, a compact, software-defined radio platform designed for rapid deployment, flexible integration, and enterprise-grade performance.

As the manufacturer of the **iCell TRINITY**, we offer hotels and hospitality technology providers a robust and scalable foundation for building private 5G networks. When paired with edge-core software and trusted eSIM provisioning partners, the iCell TRINITY enables a complete end-to-end solution—one that replaces outdated Wi-Fi and costly roaming with a frictionless guest experience. We invite you to partner with us and lead the shift toward private 5G in hospitality—delivering better service, gaining control over your network, and creating new value for your business and your guests.