Mobile Solutions for Wi-Fi

Mobile Convergence Technology
Mobile Services Demand is Growing

Telecommunication research has consistently shown that the demand for mobile devices is increasing each year. Mobile usage statistics confirm that mobile data traffic increased by 70% in 2012 compared to 2011, and it is forecasted that this growth will increase 13-fold by 2017. Tier 1 operator AT&T reported a 100% increase in wireless data traffic from 2010-2011, and a 200-fold increase in the last five years. According to Cisco, 33% of mobile data traffic within the last year was offloaded onto networks such as Wi-Fi; this in turn reduced mobile operator data traffic by 26%, thus minimising network congestion for other use. AccuROAM Wi-Fi Offload is a proven solution to help operators offload data, voice and messaging – both domestically and internationally.

When considering if Wi-Fi is the way to go for offloading data from the cellular network, operators weigh up the differences between macro cells, small cells and Wi-Fi. One researcher compared each of these with capacity, capacity density and Total Cost of Ownership (TCO). The results indicate that a combination of small cells and Wi-Fi can cope with predicted capacity density increases, cost-effectively meet capacity demands, increase traffic management efficiency and diminish per-bit TCO by 50%. In this way, AccuROAM Wi-Fi Offload acts as a complimentary element in an overall network solution to reduce capacity, capacity density and TOC.

Capitalise on Roaming

Until now, roaming has been an issue for subscribers using differing devices and networks such as 3GPP2 (CDMA or TDMA), 3GPP and IEEE 802.11 Wi-Fi. Bill shock has been a common problem, forcing subscribers to turn off mobile data roaming settings, and GSM/CDMA operators have not been able to connect their subscribers to partner networks. The introduction of Wi-Fi Roaming allows users to connect to a preferred Wi-Fi network while abroad - and remain bound to their home subscription. With AccuROAM Wi-Fi Roaming the operator can maximise roaming revenue and the subscriber can control costs while receiving fast, extended service.

Tier 1 operators are already providing international mobile data, voice and messaging solutions using AccuROAM Wi-Fi offload and

How Wi-Fi Offload can Help

• Transfer data-hungry services off the cellular network
• Avoid congestion at radio access and core networks
• Create partnerships with existing Wi-Fi operators
• Meet market data, voice and SMS consumption demands
• Provide an alternate high-speed access method
• Complement existing cellular and LTE networks
• Access new market segments, such as Wi-Fi-only devices
• Bundle Wi-Fi offload service with existing data packages

How Wi-Fi Roaming can Help

• Capture lost roaming revenue
• Minimize decreasing 3G data roaming impact margins
• Maintain and grow an international roaming footprint
• Enable positive user experiences, reduce churn
• Support multi-device and multi-network access
• Utilise existing Wi-Fi networks
• Bundle international Wi-Fi service with existing roaming packages
What is AccuROAM?

AccuROAM is a mobile convergence platform that enables cellular subscribers to seamlessly and transparently switch between mobile and alternate wireless networks. AccuROAM is a carrier grade proven solution that eliminates the technical, administrative and resource burdens of data, voice and messaging offload and roaming across protocols.

Wi-Fi has become more accepted globally as a key part of the mobile ecosystem and leading carriers have moved to embrace Wi-Fi at home and when roaming. Wi-Fi is inexpensive, spectrum independent, available on every smart phone and tablet device. AccuROAM taps into this opportunity to reduce end-user and operator pain-points simultaneously.

AccuROAM enables cellular user Wi-Fi access and provides the same service continuity to Wi-Fi end users and roaming operators as is experienced when using the cellular network. There is no disruption to service and subscribers do not have to worry about usernames/passwords or looking after additional bills. The process is completely seamless and silent.

AccuROAM enables automatic authentication by accessing customer SIM-based account credentials; this allows the operator to control subscriber and service policies, thus creating a portal for revenue generation. AccuROAM bridges the gaps between networks (including non-EAP capable devices) with advanced technological development in the core network server. This innovation sets AccuROAM ahead of all other Wi-Fi offload and roaming solutions available today. In addition, AccuROAM has been developed with intelligent policy control and is ready for Hotspot 2.0.

What can the Operator do with AccuROAM?

- Facilitate domestic and international Wi-Fi offload and roaming
- Provide Wi-Fi offload and roaming data, voice and SMS services
- Increase global coverage
- Bind global Wi-Fi footprints to mobile subscriptions
- Benefit from carrier grade performance and scalability
- Deliver seamless and consistent user experiences
- Support EAP SIM / AKA and non-EAP capable devices
- Provide automatic and secure authentication / authorization
- Control subscriber and service policies, much like on mobile
- Maintain an unlimited hotspot (SSID) white list
- Support all major devices (Android, iOS, Blackberry, Windows Phone and Symbian)
- Wholesale potential (single sign-on/bill)
- Prevent fraudulent intrusion
- Adapt to any WLAN controller
- Collect data for accounting, billing, clearing and settlement

What about Subscribers?

- Attach seamlessly to high-speed, cost-effective Wi-Fi
- Increase global coverage
- Retain existing mobile subscription services and billing methods
- Sign-on transparently – always automatic connections
- Maintain profile settings
- Avail of next generation services
Carrier grade & full integration with the mobile network is essential for successful Wi-Fi rollout.... not just for authentication and data, but for all services that users currently receive on cellular, such as charging, policy, voice, messaging and roaming.

The Nuts and Bolts
To make it all work, AccuROAM technology comprises the AccuROAM Server and AccuROAM Mobile Client. The AccuROAM Server is a carrier class service node, designed to interwork with the mobile operator’s PLMN core network and the Wi-Fi network infrastructure alike. The AccuROAM Mobile Client is a distributable smartphone application that handles automated Wi-Fi network discovery, authentication and authorised access.

AccuROAM Server
The AccuROAM Server constitutes a RADIUS and Diameter AAA server, Wi-Fi Footprint Manager server, WISPr 1+ User-Registration server, SIP Registration server and a Mobile Core Authorisation server. These Wi-Fi network and infrastructure agnostic elements provide:

- Multiple services support
- Multiple authentication options
- Client and server integration points
- SIM based secured authentication
- Billing and settlement (online, offline & roaming)
- Tunnelled access to mobile network with key management

AccuROAM NAC
Data, voice and messaging offload also requires a Wi-Fi gateway, the AccuROAM Network Access Controller (NAC), which hosts the DHCP Relay Server, Captive Portal, Policy Enforcement server, Intrusion Detection Service and WLAN Controller Adaptors.

The AccuROAM NAC provides:

- Network discovery and monitoring
- Strong user authentication
- Policy control and enforcement
- Reporting
- Web-based captive portal
- DHCP relay server
- Anti-fraud service
- Multiple WLAN controller adaptors
What does AccuROAM Offer?

- EAP SIM / AKA, WISPR 1.0 and WISPr 1+ ready
- Seamless, transparent and secure authentication/authorisation
- Mobility management
- Messaging interworking
- Voice call control
- Network access control
- Web sign-on and captive portal
- Tunnelling key management (IP Sec, SSL)
- All major smartphones compatibility (Android, iOS, Blackberry, Windows Phone and Symbian)
- Wi-Fi Footprint Management server
- Wi-Fi Offload smartphone client application, no need for end-user to input username/password
- Works with any hotspot over WISPr 1.0 protocol
- Dedicated registration process to create secured SIM-based authentication keys
- Facilitates WISPr 1+ bound to billing account-holder for SIM-free devices
- High security and encryption
- Unlimited hotspot whitelist
- Intelligent policy control ready for Hotspot 2.0
- Full mobile network integration

AccuROAM Mobile Client

The AccuROAM Mobile Client is available for non-EAP capable devices (WISPr) and all major mobile OSs are supported. The client automatically searches, selects and transparently connects to operator approved hotspots while maintaining billing and policy support. Full service continuity (MO/MT voice and messaging to a single-radio Wi-Fi attached subscriber) is available and the data connection from the end-user device to mobile core data access is securely encrypted.

WISPr 1+ is unique to Accuris Networks and provides complete security where WISPR 1.0 does not. It uses a dedicated registration process to create secured SIM-based authentication keys. This method provides strong mobile end-user authentication, with existing Wi-Fi network capability. Authentication is based on a variety of identity-key and encryption-key mechanisms.

Case Report 1: Wi-Fi Roaming

Background
Tier 1 mobile network and Wi-Fi provider in North America serving 150 million users. Wireless revenue represents 50% of total revenue, and data service represents nearly 40% of the wireless segment.

Requirements
- Capture lost roaming revenue from subscribers who found 3G data roaming too expensive or found alternative access
- Minimize impact of decreasing 3G data roaming margins as 3G data roaming wholesale prices decrease
- Maintain the lead as the operator with the greatest roaming footprint internationally
- Reduce churn by extending domestic Wi-Fi support as a value-added service into the international roaming area
- Remain access neutral by providing subscriber access to services over 3G, 4G, Wi-Fi or any network
- Access ubiquitous spectrum of Wi-Fi in key locations where roamers use heavy data (such as airports, hotels and cafes)
Implementation
By deploying AccuROAM Wi-Fi Roaming WISPr 1.0+, the operator was able to offer a Data Roaming Add-On package for subscribers travelling to selected countries, with contracts bound by a monthly data allowance and cost. The AccuROAM Mobile Client for iPhone/iPad, Android Smartphone and Android Tablets was required for this WISPr 1.0+ deployment.

Results
Subscribers experienced a seamless user experience of cellular data on-the-go, with high speed access over Wi-Fi when available; users were able to authenticate to partner hotspots without needing to enter a user name and password. The operator was able to generate additional revenue from the Data Roaming Add-On package.

Case Report 2: Cellular over Wi-Fi

Background
Tier 1 communications company in North America serving 6 million users.

Requirements
• Extend roaming experience and service continuity beyond CDMA
• Allow subscriber to make/receive voice calls and SMS on home MSISDN

Implementation
AccuROAM Wi-Fi Roaming to enable cellular over IP network.

Results
Mobile client enables all cellular services over Wi-Fi network; the same identity as cellular MSISDN is used and full voice and messaging services (over SIP/IMS) are provided.

Case Report 3: Wi-Fi Offload

Background
Tier 1 mobile network and Wi-Fi provider in the Middle East serving 16 million users. Data service revenues increased by 59% in 2011, with mobile broadband subscriptions tripling each year; actively rolling out Wi-Fi hotspots.

Requirements
• Meet dramatic demand rise of broadband data consumption
• Relieve congestion at both radio access and core network
• Re-evaluate expansion plan, which could not cope with market demand
• Avail of Wi-Fi network as an alternate access method
• Find a single solution to address unified seamless access across all smart devices

Implementation
AccuROAM Wi-Fi Offload EAP-SIM/AKA was selected as the secured Wi-Fi access for EAP capable devices including iPhone, iPad, BlackBerry and new Android series; WISPr 1.0+ was selected to cover non-EAP capable devices, primarily previous generation of Android.

Results
AccuROAM provides successful auto-authentication on the Wi-Fi network and interworking with cellular HLR. Future plans to extend WISPr 1.0+ to all devices for International Wi-Fi Roaming.
About Accuris Networks

Accuris Networks is a leading provider of Wi-Fi Offload and Roaming interworking convergence solutions for data, voice and messaging offload to Tier 1 operators. Accuris Networks produces proven carrier class performance solutions and is an established supplier of competitive, cost effective platforms internationally. Accuris Networks’ strengths lie in mobile core integration and the company is a committed contributor to the Wireless Broadband Alliance (WBA) and the GSM Association (GSMA).


3 Cisco, Cisco Visual Networking Index.


---

Mobile Wi-Fi convergence technology is merging mobile services with broadband IP communications infrastructure to gain cost-efficient services, uniform service accounts, high volume transactions, faster mobile-service access speeds and value-added services.